Bureau of Entomology & Plant Quarantine

Division of Plant Disease Control

Contents

Page

Commissioner [illegible]
State Land Department [illegible]
Boise, Idaho

Dear Commissioner [illegible]:

[illegible]

[illegible]

[illegible]

Very truly yours,

[illegible]

[illegible]

[illegible]

[illegible]
Commissioner, State Land Dept. of Idaho

Dr. A. G. Crane
President, University of Wyoming
Laramie, Wyoming.

Dear Doctor Crane:

[illegible]

[illegible]

[illegible]

Very truly yours,

(S) Avery [illegible]

Acting Chief of Bureau.

Concurred in:

/s/ A. G. Crane
President, University of Wyoming

SUMMARY OF FEDERAL EXPENDITURES, NORTHWESTERN REGION OF BLISTER RUST CONTROL
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
1922 - 1937

State	Appropriation	Total	Activity: Ribes Eradication	Methods Development	Chemical Investigation	Reconnaissance and Preeradication	Ecology	Disease Survey and Scouting	Damage Studies	Education	Quarantine Enforcement	Cultivated Black Currant Eradication	Nursery Sanitation	Office and Miscellaneous	Supervision
Idaho	Regular	$1,018,239.09	$ 533,798.01	$ 92,200.01	$ 64,575.98	$ 54,033.32	$45,103.42	$ 15,652.07	$25,679.88	$31,006.49	$ 10,758.86	$ 28,173.15	$	$ 91,338.76	$ 86,020.69
	NIRA	470,841.62	423,058.33	4,662.40	3,441.74		3,293.09			6,366.50				28,083.64	1,935.92
	ERA	1,993,495.00	1,941,122.07	256.36	937.99			15,875.78		2,753.11	1,456.86			29,592.56	1,398.72
	Total	3,482,575.71	2,897,978.41	97,118.77	68,955.71	54,033.32	48,396.51	31,527.85	25,679.88	40,126.10	12,215.72	28,173.15		149,014.96	29,355.33
Montana	Regular	171,582.88	19,264.06	11,656.90	15,809.93	11,008.17	2,533.00	13,892.33	7,517.94	8,027.01	9,781.81	22,010.30	15,160.41	25,309.44	9,611.58
	NIRA	88,306.79	80,458.56		258.00	902.74				2,689.14			148.36	3,287.99	562.00
	ERA	196,847.11	193,848.78					219.31		32.72				2,730.30	16.00
	Total	456,736.78	293,571.40	11,656.90	16,067.93	11,910.91	2,533.00	14,111.64	7,517.94	10,748.87	9,781.81	22,010.30	15,308.77	31,327.73	10,189.58
Washington	Regular	194,181.33	11,841.29	750.00	12,837.91	4,770.40	2,425.10	20,781.49	8,150.83	6,242.32	18,957.24	63,838.81	2,273.74	27,125.07	14,187.13
	NIRA	105,199.60	92,044.82		274.01					3,170.46				9,148.31	562.00
	ERA	295,943.14	186,701.62	58.57	41.74	223.37		1,203.12		6,137.71				101,543.89	33.12
	Total	595,324.07	290,587.73	808.57	13,153.66	4,993.77	2,425.10	21,984.61	8,150.83	15,550.49	18,957.24	63,838.81	2,273.74	137,817.27	14,782.25
Total Western White Pine Region	Regular	1,384,003.30	564,903.36	104,606.91	93,223.82	69,811.89	50,061.52	50,325.89	41,348.65	45,275.82	39,497.91	114,022.26	17,434.15	143,773.27	49,819.40
	NIRA	664,348.01	595,561.71	4,662.40	3,973.75	902.74	3,293.09			12,225.10			148.36	40,519.94	3,059.92
	ERA	2,486,285.25	2,321,672.47	314.93	979.73	223.37		17,298.21		8,923.54	1,456.86			133,866.75	1,447.84
	Total	4,534,636.56	3,482,137.54	109,584.24	98,177.30	70,938.00	53,354.61	67,624.10	41,348.65	66,425.46	40,954.77	114,022.26	17,582.51	318,159.96	54,327.16
Colorado	Regular	8,694.90	3,708.98		700.00			611.65		360.00	136.68			2,236.40	941.19
	NIRA	8,041.45		823.28	52.00	6,422.74				100.00				520.43	123.00
	ERA	51,317.30	47,529.93		124.11	15.11				37.00				3,486.15	125.00
	Total	68,053.65	51,238.91	823.28	876.11	6,437.85		611.65		497.00	136.68			6,242.98	1,189.19
Wyoming	Regular	8,065.20	3,668.29		700.00			214.11		359.84	47.85			2,197.14	877.97
	NIRA	7,107.41			191.42	5,641.49				100.00				1,051.50	123.00
	ERA	58,171.42	54,038.80			30.60				193.22				3,734.87	173.93
	Total	73,344.03	57,707.09		891.42	5,672.09		214.11		653.06	47.85			6,983.51	1,174.90
Total Central Rocky Mountain Region	Regular	16,760.10	7,377.27		1,400.00			825.76		719.84	184.53			4,433.54	1,819.16
	NIRA	15,148.86		823.28	243.42	12,064.23				200.00				1,571.93	246.00
	ERA	109,488.72	101,568.73		124.11	45.71				230.22				7,221.02	298.93
	Total	141,397.68	108,946.00	823.28	1,767.53	12,109.94		825.76		1,150.06	184.53			13,226.49	2,364.09
Total Northwest Region	Regular	1,400,763.40	572,280.63	104,606.91	94,623.82	69,811.89	50,061.52	51,151.65	41,348.65	45,995.66	39,682.44	114,022.26	17,434.15	148,206.81	51,638.56
	NIRA	679,496.87	595,561.71	5,485.68	4,217.17	12,966.97	3,293.09			12,426.10			148.36	42,091.87	3,305.92
	ERA	2,595,773.97	2,423,241.20	314.93	1,103.84	269.08		17,298.21		9,153.76	1,456.86			141,087.77	1,746.77
	Total	$4,676,034.24	$3,591,083.54	$110,407.52	$ 99,944.83	$ 83,047.94	$53,354.61	$ 68,449.86	$41,348.65	$67,575.52	$ 41,139.30	$ 114,022.26	$17,582.51	$ 331,386.45	$ 56,691.25

State	Forest	[illegible]	[illegible]	[illegible]
Montana?	Colville? [illegible]	[illegible]	[illegible]	[illegible]
	Total	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Kaniksu?	[illegible]	[illegible]	[illegible]
Idaho	Coeur d'Alene	[illegible]	[illegible]	[illegible]
	St. Joe	[illegible]	[illegible]	[illegible]
	Clearwater	[illegible]	[illegible]	[illegible]
	Total	[illegible]	[illegible]	[illegible]
Grand Total		[illegible]	[illegible]	[illegible]

SUMMARY OF EXPENDITURES [illegible]
[illegible]

Year	State	Federal	Total
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		19,0??.06	[illegible]
[illegible]		20,000.00	[illegible]
[illegible]	5,000.00	3?,506.32	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]		[illegible]
[illegible]	[illegible]		[illegible]
[illegible]	[illegible]		[illegible]
[illegible]	[illegible]		[illegible]
Total	[illegible]	[illegible]	[illegible]

Mount Rainier National Park [illegible]
special appropriation $??,245.37

TABLE NO. 1

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL
CALENDAR YEAR 1937, REGULAR APPROPRIATIONS

	Project	January 1 to June 30, 1937			July 1 to December 31, 1937			Grand Total
		Salaries	Expense	Total	Salaries	Expense	Total	
2.2	Development of Methods of Ribes Eradication							
	2.22 - Method Studies of Ribes Eradication, Idaho	$ 758.31	$	$ 758.31	$	$	$	$ 758.31
2.3	Developing and Testing Ribicides							
	2.3-1 - Laboratory Investigations, Ribicides	317.21		317.21*				317.21
3.2	Cooperative Ribes Eradication on Federal Lands							
	3.21-2 - Cabinet National Forest, Montana	2,251.65		2,251.65	1,619.95	47.34	1,667.29	3,918.94
3.4	Cooperative Ribes Eradication on State and Private Lands							
	3.42-1 - Clearwater Operation, Idaho	2,690.76		2,690.76	2,139.95		2,139.95	4,830.71
	3.42-2 - St. Joe Operation, Idaho	2,683.26		2,683.26	2,139.95		2,139.95	4,823.21
	3.42-3 - Coeur d'Alene Operation, Idaho	2,141.61		2,141.61	433.32		433.32	2,574.93
	3.42-4 - Kaniksu Operation, Idaho	3,315.26	454.66	3,769.92	2,139.94		2,139.94	5,909.86
	3.43-2 - Mount Spokane Operation, Washington	991.64		991.64	853.31		853.31	1,844.95
	3.44 - Rogue River Operation, Oregon	133.33		133.33*				133.33
	3.45-1 - Plumas Operation, California	195.83		195.83*				195.83
	3.45-2 - Sierra Operation, California	195.83		195.83*				195.83
	3.45-3 - Eldorado Operation, California	133.33		133.33*				133.33
	3.45-4 - Stanislaus Operation, California	324.99		324.99*				324.99
	3.46 - Medicine Bow Operation, Wyoming	1,124.97		1,124.97	319.99		319.99	1,444.96
	3.47 - Pike Operation, Colorado	1,016.64		1,016.64	319.99		319.99	1,336.63
4.1	Field Studies, Spread of the Rust							
	4.12 - Idaho				1,599.96		1,599.96	1,599.96
	4.15 - California	137.50		137.50*				137.50
6.	Educational Work	2,899.92		2,899.92	1,299.96		1,299.96	4,199.88
9.	Maintenance of Field Office and Miscellaneous Expenses							
	9.1 - Supervision	2,299.92		2,299.92	2,299.92		2,299.92	4,599.84
	9.2 - Office Maintenance	7,818.28		7,818.28	4,483.28		4,483.28	12,301.56
	9.4 - Purchases made in Washington, D. C.		590.47	590.47		4.00	4.00	594.47
	Grand Total	$31,430.24	$1,045.13	$32,475.37	$19,649.52	$ 51.34	$19,700.86	$52,176.23

* Vouchers for these activities submitted for payment by Spokane Office thru January 15, 1937 only; thereafter submitted thru Oakland and Berkeley offices for payment from San Francisco and recorded against the respective allotments in the Oakland and Berkeley offices.

TABLE NO. 2

SUPPLEMENTAL* REPORT OF FEDERAL EXPENSES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL
JULY 23-DECEMBER 31, 1935; JANUARY 1-DECEMBER 31, 1936
001089, EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT QUARANTINE
1935-1937

Project	Adjustments and Additions to 1935 and 1936 Annual Report Tables*	
	July 23-December 31, 1935	January 1-June 30, 1936
OP 1-147, Montana		
8.41-2-3, Cooperative Ribes Eradication, Cabinet-Kootenai Operations	$ (- 409.47)	
Total OP 1-147, Montana	$ (- 409.47)	
OP 1-140, Idaho		
8.1-2 Inspection of Nursery Stock in Transit		$ (- 1.50)
8.2-3 Developing and Testing Ribicides	5.38	
8.42-1 Cooperative Ribes Eradication, Clearwater Operation	1,364.32	(-133.34)
8.42-2 Cooperative Ribes Eradication, St. Joe Operation	(- 119.71)	109.91
8.42-3 Cooperative Ribes Eradication, Coeur d'Alene Operation	1,477.32	148.69
8.42-4 Cooperative Ribes Eradication, Kaniksu Operation	162.01	4.22
8.6 Educational Work	40.36	5.59
8.9-1 Supervision	55.60	
8.9-2 Spokane Office Maintenance and Supplies	386.54	
8.9-3 Miscellaneous Supplies and Services	32.64	14.01
Total OP 1-140, Idaho	3,404.46	147.58
OP 1-160, Washington		
8.43-2 Cooperative Ribes Eradication, Mount Spokane Operation	(-1,130.50)	
8.6 Educational Work	1.90	
8.7 Summarization of Field Data	(- 2.15)	
8.9-2 Spokane Office Maintenance and Supplies	825.00	
8.9-3 Miscellaneous Supplies and Services	627.88	49.44
Total OP 1-160, Washington	322.13	49.44
OP 1-163, Wyoming		
8.46 Cooperative Ribes Eradication, Washakie and Medicine Bow Operations	115.77	
Total OP 1-163, Wyoming	115.77	
OP 1-137, Colorado		
8.47 Cooperative Ribes Eradication, Pike Operation	(- 275.26)	28.00
Total OP 1-137, Colorado	(- 275.26)	28.00
Grand Total, Adjustments and Additions	$ 3,157.63	$ 225.02

* Credits and additions to expenses on page 231 of 1935 annual report represent differences between estimated outstanding obligations at rendition of report and actual paid vouchers, also credits from Forest Service for supplies returned to warehouse and other inter-project adjustments subsequent to rendition of 1935 report.
1936 items listed above represent vouchers paid after rendition 1936 report (page 303) and inter-project adjustments.
No outstanding items were included in the 1936 report.

TABLE NO. 3

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL
JANUARY 1-JUNE 30, 1937
001089, EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT
QUARANTINE, 1935-1937

Project	Salaries	Expense	Total
OP 1-147, Montana			
8.41-2-3 Cooperative Ribes Eradication, Cabinet and Kootenai Operations	$1,578.68	$2,631.03	$ 4,209.71
8.9-2 Spokane Office Maintenance	255.00		255.00
Total OP 1-147, Montana	1,833.68	2,631.03	4,464.71
OP 1-140, Idaho			
8.12 Field Studies, Pine Disease Survey	133.33		133.33
8.42-1 Cooperative Ribes Eradication, Clearwater Operation	809.03	144.55	953.58
8.42-2 Cooperative Ribes Eradication, St. Joe Operation	916.61	144.54	1,061.15
8.42-3 Cooperative Ribes Eradication, Coeur d'Alene Operation	593.35	57.57	650.92
8.42-4 Cooperative Ribes Eradication, Kaniksu Operation	505.93	61.66	567.59
8.42-5 Cooperative Ribes Eradication, Mount Spokane Operation	216.66		216.66
8.6 Educational Work	150.00		150.00
8.9-2 Spokane Office Maintenance and Supplies	827.49		827.49
Total OP 1-140, Idaho	4,152.40	408.32	4,560.72
OP 1-160, Washington			
8.13 Field Studies, Pine Disease Survey	450.00		450.00
8.43-2 Cooperative Ribes Eradication, Mount Spokane Operation	399.99		399.99
8.9-2 Spokane Office Maintenance and Supplies	812.49		812.49
Total OP 1-160, Washington	1,662.48		1,662.48
OP 1-163, Wyoming			
8.46 Cooperative Ribes Eradication, Medicine Bow Operation	299.99		299.99
Total OP 1-163, Wyoming	299.99		299.99
OP 1-137, Colorado			
8.47 Cooperative Ribes Eradication, Pike Operation	572.91	887.75	1,460.66
Total OP 1-137, Colorado	572.91	887.75	1,460.66
Grand Total January 1-June 30, 1937	$8,521.46	$3,927.10	$12,448.56

Allotment balances for this appropriation not available for expenditures incurred after June 30, 1937.

TABLE NO. 4

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL
JANUARY 1-JUNE 30, 1937
201085, EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT QUARANTINE, FLOOD CONTROL AND OTHER CONSERVATION, 1936 & 1937

Project	Salaries	Expense	Total
OP 201-5010, Montana			
8.11 Field Studies, Pine Disease Survey	$	$ 1.20*	$ 1.20
8.41-2 Cooperative Ribes Eradication, Cabinet and Kootenai Operations	10,270.44	4,209.61*	14,480.05
8.9-1 Supervision		2.50	2.50
8.9-2 Office Maintenance		27.48	27.48
8.9-3 Miscellaneous Supplies and Services		252.00	252.00
Total OP 201-5010, Montana	10,270.44	4,492.79	14,763.23
OP 201-5010, Idaho			
8.12 Field Studies, Pine Disease Survey	3,305.32	120.24	3,425.56
8.22 Method Studies of Ribes Eradication		180.65	180.65
8.2-3 Developing and Testing Ribicides		1.30*	1.30
8.42-1 Cooperative Ribes Eradication, Clearwater Operation	26,854.62	37,943.03*	64,797.65
8.42-2 Cooperative Ribes Eradication, St. Joe Operation	31,135.58	44,301.96*	75,437.54
8.42-3 Cooperative Ribes Eradication, Coeur d'Alene Operation	2,975.07	3,143.89*	6,118.96
8.42-4 Cooperative Ribes Eradication, Kaniksu Operation	34,148.97	28,880.35*	63,029.32
8.42-5 Cooperative Ribes Eradication, Mount Spokane Operation	541.65		541.65
8.6 Educational Work	435.00	457.59	892.59
8.9-1 Supervision		487.51	487.51
8.9-2 Spokane Office Maintenance and Supplies	2,368.32	3,307.78	5,676.10
8.9-3 Miscellaneous Supplies and Services		3,468.58*	3,468.58
Total OP 201-5010, Idaho	101,764.53	122,292.88	224,057.41
OP 201-5010, Washington			
8.13 Field Studies, Pine Disease Survey	600.00	70.00	670.00
8.23 Method Studies of Ribes Eradication	15.92	29.85	45.77
8.33-1 Cooperative Ribes Eradication, Mount Rainier National Park		27.29	27.29
8.43-2 Cooperative Ribes Eradication, Mount Spokane Operation	10,096.09	4,944.23	15,040.32
8.6 Educational Work	829.78	42.75	872.53
8.9-1 Supervision		10.95	10.95
8.9-2 Spokane Office Maintenance and Supplies	17,697.00	71.10	17,768.10
8.9-3 Miscellaneous Supplies and Services		759.84*	759.84
Total OP 201-5010, Washington	29,238.79	5,956.01	35,194.80
OP 201-5010, Wyoming			
8.46 Cooperative Ribes Eradication, Medicine Bow Operation	7,570.78	1,795.46*	9,366.24
Total OP 201-5010, Wyoming	7,570.78	1,795.46	9,366.24
OP 201-5010, Colorado			
8.47 Cooperative Ribes Eradication, Pike Operation	1,064.48	103.95*	1,168.43
Total OP 201-5010, Colorado	1,064.48	103.95	1,168.43
Grand Total January 1-June 30, 1937	$149,909.02	$134,641.09	$284,550.11*

*Include minor expense items for July 1-December 31, 1936 which were paid after rendering the 1936 annual report for that period.
Allotment balances for this appropriation not available for expenditures incurred after June 30, 1937.

TABLE NO. 5

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL
JULY 1-DECEMBER 31, 1937
501082, EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT
QUARANTINE, PUBLIC BUILDINGS, PARKS, UTILITIES, FLOOD CONTROL, ETC. 1938

Project	Salaries	Expense	Total
501-2-108, Idaho			
8.12 Field Studies, Pine Disease Survey	$ 4,565.66	$ 206.00	$ 4,771.66
8.22 Method Studies of Ribes Eradication		74.41	74.41
8.42-1 Cooperative Ribes Eradication, Clearwater Operation	47,994.05	19,657.18	67,651.23
8.42-2 Cooperative Ribes Eradication, St. Joe Operation	52,997.54	19,944.42	72,941.96
8.42-3 Cooperative Ribes Eradication, Coeur d'Alene Operation	866.64	145.04	1,011.68
8.42-4 Cooperative Ribes Eradication, Kaniksu Operation	47,401.88	16,783.57	64,185.45
8.6 Educational Work		227.88	227.88
8.9-1 Supervision		86.35	86.35
8.9-2 Spokane Office Maintenance and Supplies	2,654.94	1,450.54	4,105.48
8.9-3 Miscellaneous Supplies and Services		306.74	306.74
Total 501-2-108, Idaho	156,480.71	58,882.13	215,362.84
501-2-108, Washington			
8.13 Field Studies, Pine Disease Survey		34.44	34.44
8.23 Method Studies of Ribes Eradication		12.80	12.80
8.33-1 Cooperative Ribes Eradication, Mount Rainier National Park		152.20	152.20
8.43-1 Preeradication Survey, Kaniksu Operation		223.37	223.37
8.43-2 Cooperative Ribes Eradication, Mount Spokane Operation	22,246.91	6,699.21	28,946.12
8.6 Educational Work	950.00	67.82	1,017.82
8.9-1 Supervision		22.17	22.17
8.9-2 Spokane Office Maintenance and Supplies	8,655.80	4.14	8,659.94
8.9-3 Miscellaneous Supplies and Services		135.62	135.62
Total 501-2-108, Washington	31,852.71	7,351.77	39,204.48
501-2-108, Wyoming			
8.46 Cooperative Ribes Eradication, Medicine Bow Operation	7,513.57	2,143.61	9,657.18
8.9-1 Supervision		48.93	48.93
Total 501-2-108, Wyoming	7,513.57	2,192.54	9,706.11
501-2-108, Colorado			
8.47 Cooperative Ribes Eradication, Pike Operation	7,278.01	2,600.41	9,878.42
Total 501-2-108, Colorado	7,278.01	2,600.41	9,878.42
Grand Total July 1-December 31, 1937	$203,125.00	$71,026.85	$274,151.85

501009, EMERGENCY RELIEF, AGRICULTURE, ADMINISTRATIVE EXPENSE, 1938

Project	Salaries	Expense	Total
501-9-1, Administrative			
8.11 Field Studies, Spread of the Rust, Montana		216.58	216.58
8.13 Field Studies, Spread of the Rust, Washington		40.00	40.00
8.41-2 Cabinet Operation, Montana		2.50	2.50
8.6 Educational Work		139.46	139.46
8.9-1 Supervision		41.55	41.55
8.9-2 Maintenance Spokane Office	4,451.98	816.39	5,268.37
8.9-3 Miscellaneous Supplies and Services		496.66	496.66
Total Administrative	$ 4,451.98	$ 1,753.14	$ 6,205.12

[illegible]

[illegible]

[illegible]

[illegible]

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE NO. [illegible]

CLASSIFIED EXPENDITURES, CALENDAR YEAR [illegible]

[illegible]

Item	[illegible]			Bureau of Entomology and Plant Quarantine			[illegible]
	Regular	ERA	Total	Regular	ERA	Total	
[illegible]	$ [illegible]	$	$ 16,805.83	$[illegible],701.10	$ 1[illegible]	$ 45,[illegible]	$
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	70[illegible],365.[illegible]	5[illegible].50	[illegible]	241,[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible].36	87,[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]		[illegible],239.[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]		18,[illegible]	18,[illegible]	
[illegible]	[illegible]	5,[illegible].47	[illegible]	[illegible].34	16,91[illegible].19	16,[illegible]	
[illegible]		[illegible]	300.00		[illegible] 44	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]		5,31[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	21,[illegible]		[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

SUMMARY OF RIBES ERADICATION, 1937
INLAND EMPIRE

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Total Effective Man Days	Total Ribes	Total Gallons Spray
Open Reproduction	19,923	13,425	113	33,461	46,219	11,481,106	
Dense Reproduction	1,215	307		1,522	872	138,139	
Open Pole	19,535	6,074	53	25,662	12,328	2,382,381	
Dense Pole	881	616		1,497	290	29,384	
Open Mature	35,793	3,884	9	39,686	21,223	4,386,836	
Dense Mature	776	218		994	271	29,861	
Cut Over	848	3,389	48	4,285	4,601	1,359,629	
Brush	352	1,211	15	1,578	946	66,496	
Burn	472			472	368	132,914	
Subalpine	84	218		302	143	9,454	
Meadow-Field	242			242			
All Upland	80,121	29,342	238	109,701	87,261	20,016,200	
Stream (Hand)	3,018	4,026	242	7,286	17,092	5,404,101	
Stream (Chemical)	1,253	1,254		2,507	6,707	603,384	201,128
Stream (Slash)	16	3		19	104	9,500	
Stream (Machine)	500	15		515	3,912	354,076	
All Stream	3,534	4,044	242	7,820	27,815	6,371,061	
All Types	83,655	33,386	480	117,521	115,076	26,387,261	

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Ribes	Gallons Spray
Open Reproduction	19,923	35,378	9,467,691		1.78	475	
Dense Reproduction	1,215	685	118,993		.56	98	
Open Pole	19,535	9,212	1,991,391		.47	102	
Dense Pole	881	80	10,835		.09	12	
Open Mature	35,793	18,531	4,147,362		.52	116	
Dense Mature	776	199	24,169		.26	31	
Cut Over	848	1,563	571,130		1.84	674	
Brush	352	22	297		.01	1	
Burn	472	368	132,914		.78	282	
Subalpine	84	8	613		.10	7	
Meadow-Field	242						
All Upland	80,121	66,046	16,465,395		.82	206	
Stream (Hand)	3,018	11,002	4,151,834		3.65	1,376	
Stream (Chemical)	1,253	5,061	524,145	174,715	4.04	418	139
Stream (Slash)	16	65	8,000		4.06	500	
Stream (Machine)	500	3,876	351,076		7.75	702	
All Stream	3,534	20,004	5,035,055		5.66	1,425	
All Types	83,655	86,050	21,500,450		1.03	257	

TABLE NO. 3B - SECOND WORKING

Open Reproduction	13,425	10,745	1,993,338		.80	148	
Dense Reproduction	307	187	19,146		.61	62	
Open Pole	6,074	3,097	389,965		.51	64	
Dense Pole	616	210	18,549		.34	30	
Open Mature	3,884	2,685	239,320		.69	62	
Dense Mature	218	72	5,692		.33	26	
Cut Over	3,389	2,995	776,046		.88	229	
Brush	1,211	907	65,761		.75	54	
Subalpine	218	135	8,841		.62	41	
All Upland	29,342	21,033	3,516,658		.72	120	
Stream (Hand)	4,026	5,687	1,210,868		1.41	301	
Stream (Chemical)	1,254	1,646	79,239	26,413	1.31	63	21
Stream (Slash)	3	39	1,500		13.00	500	
Stream (Machine)	15	36	3,000		2.40	200	
All Stream	4,044	7,408	1,294,607		1.83	320	
All Types	33,386	28,441	4,811,265		.85	144	

TABLE NO. 3C - THIRD WORKING

Open Reproduction	113	96	20,077		.85	178	
Open Pole	53	19	1,025		.36	19	
Open Mature	9	7	154		.78	17	
Cut Over	48	43	12,453		.90	259	
Brush	15	17	438		1.13	29	
All Upland	238	182	34,147		.76	143	
Stream (Hand)	242	403	41,399		1.67	171	
All Types	480	585	75,546		1.22	157	

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1937
INLAND EMPIRE

State	Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes
Idaho	First	EQ-ERA	33,635	30,547	7,173,469	930	.91	213
		FS-ERA	10,576	8,348	2,313,922		.79	219
		FS-Reg.	23,948	29,702	8,379,570	166,635	1.24	350
		FS-Bulldozer	425	3,232	311,576		7.60	733
		Cooperative	8,467	3,226	911,078		.38	108
		F-ECW	1,929	2,610	307,461		1.35	159
		Total	78,980	77,665	19,397,076	167,565	.98	246
	Second	EQ-ERA	12,357	9,020	1,844,693	3,237	.73	149
		FS-ERA	4,440	3,676	458,330		.83	103
		FS-Reg.	7,581	8,155	1,585,710	23,176	1.08	209
		Cooperative	247	129	22,674		.52	92
		F-ECW	351	890	89,606		2.54	255
		S&P-ECW	2,176	1,001	72,194		.46	33
		Total	27,152	22,871	4,073,207	26,413	.84	150
	Third	EQ-ERA	134	270	33,385		2.01	249
		FS-ERA	108	133	8,014		1.23	74
		Total	242	403	41,399		1.67	171
	All Workings	EQ-ERA	46,126	39,837	9,051,547	4,167	.86	196
		FS-ERA	15,124	12,157	2,780,266		.80	184
		FS-Reg.	31,529	37,857	9,965,280	189,811	1.20	316
		FS-Bulldozer	425	3,232	311,576		7.60	733
		Cooperative	8,714	3,355	933,752		.38	107
		F-ECW	2,280	3,500	397,067		1.54	174
		S&P-ECW	2,176	1,001	72,194		.46	33
		Total	106,374	100,939	23,511,682	193,978	.95	221
Washington	First	EQ-ERA	1,945	3,715	1,005,900		1.91	517
	Second	EQ-ERA	4,195	3,778	565,920		.90	135
		FS-ERA	1,949	1,678	154,764		.86	79
		Total	6,144	5,456	720,684		.89	117
	Third	EQ-ERA	238	182	34,147		.76	143
	All Workings	EQ-ERA	6,378	7,675	1,605,967		1.20	252
		FS-ERA	1,949	1,678	154,764		.86	79
		Total	8,327	9,353	1,760,731		1.12	211
Montana	First	EQ-ERA	856	691	252,312		.81	295
		FS-ERA	1,799	3,697	805,662	7,150	2.06	448
		FS-Bulldozer	75	282	39,500		3.76	527
		Total	2,730	4,670	1,097,474	7,150	1.71	402
	Second	EQ-ERA	75	78	14,374		1.04	192
		FS-Bulldozer	15	36	3,000		2.40	200
		Total	90	114	17,374		1.27	193
	All Workings	EQ-ERA	931	769	266,686		.83	286
		FS-ERA	1,799	3,697	805,662	7,150	2.06	448
		FS-Bulldozer	90	318	42,500		3.53	472
		Total	2,820	4,784	1,114,848	7,150	1.70	395
Total	First	EQ-ERA	36,436	34,953	8,431,681	930	.96	231
		FS-ERA	12,375	12,045	3,119,584	7,150	.97	252
		FS-Reg.	23,948	29,702	8,379,570	166,635	1.24	350
		FS-Bulldozer	500	3,514	351,076		7.03	702
		Cooperative	8,467	3,226	911,078		.38	108
		F-ECW	1,929	2,610	307,461		1.35	159
		Total	83,655	86,050	21,500,450	174,715	1.03	257
	Second	EQ-ERA	16,627	12,876	2,424,987	3,237	.77	146
		FS-ERA	6,389	5,354	613,094		.84	96
		FS-Reg.	7,581	8,155	1,585,710	23,176	1.08	209
		FS-Bulldozer	15	36	3,000		2.40	200
		Cooperative	247	129	22,674		.52	92
		F-ECW	351	890	89,606		2.54	255
		S&P-ECW	2,176	1,001	72,194		.46	33
		Total	33,386	28,441	4,811,265	26,413	.85	144
	Third	EQ-ERA	372	452	67,532		1.22	181
		FS-ERA	108	133	8,014		1.23	74
		Total	480	585	75,546		1.22	157
	All Workings	EQ-ERA	53,435	48,281	10,924,200	4,167	.90	204
		FS-ERA	18,872	17,532	3,740,692	7,150	.93	198
		FS-Reg.	31,529	37,857	9,965,280	189,811	1.20	316
		FS-Bulldozer	515	3,550	354,076		6.89	688
		Cooperative	8,714	3,355	933,752		.38	107
		F-ECW	2,280	3,500	397,067		1.54	174
		S&P-ECW	2,176	1,001	72,194		.46	33
		Total	117,521	115,076	26,387,261	201,128	.98	225

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1937
INLAND EMPIRE

State	Working	Number of Acres Worked: By Forest Service: Forest Service	By Forest Service: Private	By Bureau of Entomology and Plant Quarantine: Federal: Forest Service	By Bureau of Entomology and Plant Quarantine: Federal: Public Domain	By Bureau of Entomology and Plant Quarantine: Federal: Total	By Bureau of Entomology and Plant Quarantine: State	By Bureau of Entomology and Plant Quarantine: Private	Total: Federal: Forest Service	Total: Federal: Public Domain	Total: Federal: Total	Total: State	Total: Private	Total
Idaho	First	34,318	2,560	4,328	200	4,528	24,414	13,160	38,646	200	38,846	24,414	15,720	78,980
	Second	10,087	2,285	2,256	360	2,616	4,426	7,738	12,343	360	12,703	4,426	10,023	27,152
	Third	108		12	12	24	44	66	120	12	132	44	66	242
	Total	44,513	4,845	6,596	572	7,168	28,884	20,964	51,109	572	51,681	28,884	25,809	106,374
Washington	First						1,628	317				1,628	317	1,945
	Second	1,128	821				2,040	2,155	1,128		1,128	2,040	2,976	6,144
	Third						153	85				153	85	238
	Total	1,128	821				3,821	2,557	1,128		1,128	3,821	3,378	8,327
Montana	First	1,263	611	830		830		26	2,093		2,093		637	2,730
	Second	15		75		75			90		90			90
	Total	1,278	611	905		905		26	2,183		2,183		637	2,820
Total	First	35,581	3,171	5,158	200	5,358	26,042	13,503	40,739	200	40,939	26,042	16,674	83,655
	Second	11,230	3,106	2,331	360	2,691	6,466	9,893	13,561	360	13,921	6,466	12,999	33,386
	Third	108		12	12	24	197	151	120	12	132	197	151	480
	Total	46,919	6,277	7,501	572	8,073	32,705	23,547	54,420	572	54,992	32,705	29,824	117,521

TABLE NO. 6

TOTAL RIBES BY SPECIES ERADICATED, 1937
INLAND EMPIRE

Working	Eradication Type	Acres	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	Total Ribes
First	Open Reproduction	19,923	2,031,184	7,355,997	4,076	9,922	66,512		9,467,691
	Dense Reproduction	1,215	46,619	37,177		33,810	1,387		118,993
	Open Pole	19,535	1,144,821	768,919	13,142	3,887	60,622		1,991,391
	Dense Pole	881	2,746	8,089					10,835
	Open Mature	35,793	2,809,082	1,211,367	15,756	21,404	89,753		4,147,362
	Dense Mature	776	23,993	176					24,169
	Cut Over	848	198,073	371,444	1,339	274			571,130
	Brush	352	266	31					297
	Burn	472	57,446	74,897	568		3		132,914
	Subalpine	84	223	390					613
	Meadow-Field	242							
	All Upland	80,121	6,314,453	9,828,487	34,881	69,297	218,277		16,465,395
	Stream	3,534	3,507,714	76,384	560,227	882,669	6,356	1,705	5,035,055
	All Types	83,655	9,822,167	9,904,871	595,108	951,966	224,633	1,705	21,500,450
Second	Open Reproduction	13,425	682,996	1,288,363	1,241	20,620	118		1,993,338
	Dense Reproduction	307	10,968	8,178					19,146
	Open Pole	6,074	189,197	191,103	7,697	1,968			389,965
	Dense Pole	616	10,710	7,549		290			18,549
	Open Mature	3,884	89,005	145,734	1,994	2,587			239,320
	Dense Mature	218	4,186	848		658			5,692
	Cut Over	3,389	137,876	627,402	2,549	8,219			776,046
	Brush	1,211	21,986	43,739		36			65,761
	Subalpine	218	4,819	4,022					8,841
	All Upland	29,342	1,151,743	2,316,938	13,481	34,378	118		3,516,658
	Stream	4,044	912,086	46,629	183,699	152,173	20		1,294,507
	All Types	33,386	2,063,829	2,363,567	197,180	186,551	138		4,811,265
Third	Open Reproduction	113	9,561	10,516					20,077
	Open Pole	53	626	399					1,025
	Open Mature	9	54	100					154
	Cut Over	48	8,578	3,875					12,453
	Brush	15	140	298					438
	All Upland	238	18,959	15,188					34,147
	Stream	242	23,489	3,413	14,105	392			41,399
	All Types	480	42,448	18,601	14,105	392			75,546
All Workings	Open Reproduction	33,461	2,723,741	8,654,876	5,317	30,542	66,630		11,481,106
	Dense Reproduction	1,522	57,587	45,355		33,810	1,387		138,139
	Open Pole	25,662	1,334,644	960,421	20,839	5,855	60,622		2,382,381
	Dense Pole	1,497	13,456	15,638		290			29,384
	Open Mature	39,686	2,898,141	1,357,201	17,750	23,991	89,753		4,386,836
	Dense Mature	994	28,179	1,024		658			29,861
	Cut Over	4,285	344,527	1,002,721	3,888	8,493			1,359,629
	Brush	1,578	22,392	44,068		36			66,496
	Burn	472	57,446	74,897	568		3		132,914
	Subalpine	302	5,042	4,412					9,454
	Meadow-Field	242							
	All Upland	109,701	7,485,155	12,160,613	48,362	103,675	218,395		20,016,200
	Stream	7,820	4,443,289	126,426	758,031	1,035,234	6,376	1,705	6,371,061
	All Types	117,521	11,928,444	12,287,039	806,393	1,138,909	224,771	1,705	26,387,261

SUMMARY OF RIBES ERADICATION, 1923-1937
INLAND EMPIRE

TABLE NO. 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Total Effective Man Days	Total Ribes	Gellons Spray
Open Reproduction	409,545	22,934	212	432,691	488,469	142,448,786	
Dense Reproduction	88,734	2,691		91,425	37,644	5,557,150	
Open Pole	242,443	16,533	91	259,067	109,314	20,762,760	
Dense Pole	67,323	2,038	12	69,373	14,685	2,346,123	
Open Mature	631,448	20,954	9	652,411	291,900	64,340,685	
Dense Meture	66,905	1,095		68,000	8,149	1,107,636	
Cut Over	44,148	9,876	48	54,072	49,829	16,609,218	
Brush	23,220	1,781	15	25,016	23,818	4,603,581	
Burn	9,859			9,859	6,850	3,381,358	
Subalpine	2,935	218		3,153	1,985	451,277	
Meadow-Field	2,401			2,401	151	12,131	
All Upland	1,588,961	78,120	387	1,667,468	1,032,794	261,620,705	
Stream (Hand)	111,890	27,494	4,514	143,898	233,813	58,490,972	
Stream (Chemical)	21,520	6,155	161	27,836	58,239	4,746,362	1,551,249
Stream (Slesh)	1,578	53	40	1,671	19,489	1,008,814	
Stream (Machine)	1,877	15		1,892	10,170	1,042,576	
All Stream	115,740	27,841	4,514	148,095	321,711	65,288,724	
All Types	1,704,701	105,961	4,901	1,815,563	1,354,505	326,909,429	

TABLE NO. 7A - FIRST WORKING

Eradicetion Type	Acres	Effective Men Days	Total Ribes	Gallons Spray	Per Acre Basis Men Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Open Reproduction	409,545	467,056	139,094,551		1.14	340	
Dense Reproduction	88,734	36,109	5,406,088		.41	61	
Open Pole	242,443	101,880	19,825,759		.42	82	
Dense Pole	67,323	14,129	2,299,447		.21	34	
Open Mature	631,448	281,440	62,796,625		.45	99	
Dense Mature	66,905	7,745	1,064,382		.12	16	
Cut Over	44,148	41,058	14,902,064		.93	338	
Brush	23,220	22,207	4,447,534		.96	192	
Burn	9,859	6,850	3,381,358		.69	343	
Subalpine	2,935	1,850	442,436		.63	151	
Meedow-Field	2,401	151	12,131		.06	5	
All Upland	1,588,961	980,475	253,672,375		.62	160	
Stream (Hend)	111,890	196,242	52,047,367		1.75	465	
Stream (Chemical)	21,520	50,548	4,303,440	1,403,545	2.35	200	65
Stream (Slesh)	1,578	18,051	971,517		11.44	616	
Stream (Mechine)	1,877	10,134	1,039,576		5.40	554	
All Streem	115,740	274,975	58,361,900		2.38	504	
All Types	1,704,701	1,255,450	312,034,275		.74	183	

TABLE NO. 7B - SECOND WORKING

Eradicetion Type	Acres	Effective Men Days	Total Ribes	Gallons Spray	Per Acre Basis Men Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Open Reproduction	22,934	20,967	3,291,823		.91	144	
Dense Reproduction	2,691	1,535	151,062		.57	56	
Open Pole	16,533	7,320	930,170		.44	56	
Dense Pole	2,038	552	46,616		.27	23	
Open Meture	20,954	10,453	1,543,906		.50	74	
Dense Mature	1,095	404	43,254		.37	40	
Cut Over	9,876	8,728	1,694,701		.88	172	
Brush	1,781	1,594	155,609		.90	87	
Subalpine	218	135	8,841		.62	41	
All Upland	78,120	51,688	7,865,982		.66	101	
Stream (Hand)	27,494	32,441	5,802,645		1.18	211	
Stream (Chemical)	6,155	7,422	423,665	141,285	1.21	69	23
Stream (Slash)	53	796	17,294		15.02	326	
Stream (Machine)	15	36	3,000		2.40	200	
All Streem	27,841	40,695	6,246,604		1.46	224	
All Types	105,961	92,383	14,112,586		.87	133	

TABLE NO. 7C - THIRD WORKING

Eradicetion Type	Acres	Effective Men Days	Total Ribes	Gallons Spray	Per Acre Basis Men Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Open Reproduction	212	446	62,412		2.10	294	
Open Pole	91	114	6,831		1.25	75	
Dense Pole	12	4	60		.33	5	
Open Mature	9	7	154		.78	17	
Cut Over	48	43	12,453		.90	259	
Brush	15	17	438		1.13	29	
All Upland	387	631	82,348		1.63	213	
Streem (Hand)	4,514	5,130	640,963		1.14	142	
Streem (Chemicel)	161	269	19,257	6,419	1.67	120	40
Streem (Slesh)	40	642	20,000		16.05	500	
All Stream	4,514	6,041	680,220		1.34	151	
All Types	4,901	6,672	762,568		1.36	156	

TABLE NO. 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1923-1937
INLAND EMPIRE

State	Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis	
							Men Days	Ribes
Idaho	First	EQ-Reg.	44,572	15,195	3,913,072		.34	88
		FS-Reg.	105,429	105,019	29,881,178	218,820	1.00	283
		EQ-NIRA	61,375	37,916	13,414,672	24,200	.62	219
		FS-NIRA	270,392	160,637	47,282,380	113,170	.59	175
		EQ-ERA	302,895	203,490	51,462,398	118,716	.67	170
		FS-ERA	24,748	22,262	5,313,821		.90	215
		Cooperative	207,449	98,270	29,812,084	339,769	.47	144
		F-ECW	327,890	363,960	75,374,815	304,967	1.11	230
		S&P-ECW	166,813	127,659	26,122,385	234,341	.77	157
		Total	1,511,563	1,134,408	282,576,805	1,353,983	.75	187
	Second	FS-Reg.	20,260	14,522	3,027,089	23,805	.72	149
		EQ-NIRA	2,818	1,888	451,021	3,355	.67	160
		FS-NIRA	16,342	7,262	966,499	8,007	.44	59
		EQ-ERA	25,638	18,165	3,007,064	5,614	.71	117
		FS-ERA	4,440	3,676	458,330		.83	103
		Cooperative	5,579	3,318	624,259	13,227	.59	112
		F-ECW	14,954	26,256	3,158,298	39,397	1.76	211
		S&P-ECW	6,434	7,704	863,262	43,750	1.20	134
		Total	96,465	82,791	12,555,822	137,155	.86	130
	Third	FS-Reg.	446	348	31,543		.78	71
		FS-NIRA	914	747	127,700	1,922	.82	140
		EQ-ERA	134	270	33,385		2.01	249
		FS-ERA	108	133	8,014		1.23	74
		F-ECW	1,308	2,380	388,277	4,497	1.82	297
		S&P-ECW	366	162	17,305		.44	47
		Total	3,276	4,040	606,224	6,419	1.23	185
	All Workings	EQ-Reg.	44,572	15,195	3,913,072		.34	88
		FS-Reg.	126,135	119,889	32,939,810	242,625	.95	261
		EQ-NIRA	64,193	39,804	13,865,693	27,555	.62	216
		FS-NIRA	287,648	168,646	48,376,579	123,099	.59	168
		EQ-ERA	328,667	221,925	54,502,847	124,330	.68	166
		FS-ERA	29,296	26,071	5,780,165		.89	197
		Cooperative	213,028	101,588	30,436,343	352,996	.48	143
		F-ECW	344,152	392,596	78,921,390	348,861	1.14	229
		S&P-ECW	173,613	135,525	27,002,952	278,091	.78	156
		Total	1,611,304	1,221,239	295,738,851	1,497,557	.76	184
Washington	First	FS-Reg.	213	1,043	106,500		4.90	500
		EQ-NIRA	26,733	11,711	4,348,258		.44	163
		FS-NIRA	34,417	12,708	3,858,496		.37	112
		EQ-ERA	19,470	27,420	7,106,215		1.41	365
		F-ECW	9,949	10,502	1,487,913		1.05	149
		Total	90,782	63,384	16,907,382		.70	186
	Second	EQ-ERA	5,396	5,165	810,034		.96	150
		FS-ERA	1,949	1,678	154,764		.86	79
		Total	7,345	6,843	964,798		.93	131
	Third	EQ-ERA	238	182	34,147		.76	143
	All Workings	FS-Reg.	213	1,043	106,500		4.90	500
		EQ-NIRA	26,733	11,711	4,348,258		.44	163
		FS-NIRA	34,417	12,708	3,858,496		.37	112
		EQ-ERA	25,104	32,767	7,950,396		1.31	317
		FS-ERA	1,949	1,678	154,764		.86	79
		F-ECW	9,949	10,502	1,487,913		1.05	149
		Total	98,365	70,409	17,906,327		.72	182
Montana	First	EQ-Reg.	1,383	2,315	462,300	30,665	1.67	334
		FS-Reg.	2,625	987	306,078		.38	117
		EQ-NIRA	21,773	8,027	2,158,067		.37	99
		FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211
		EQ-ERA	42,313	20,386	3,292,671	1,330	.48	78
		FS-ERA	1,799	3,697	805,662	7,150	2.06	448
		F-ECW	10,248	5,457	841,068		.53	82
		Total	102,356	57,658	12,550,088	49,562	.56	123
	Second	EQ-Reg.	619	980	299,410	4,130	1.58	484
		FS-Reg.	190	172	26,919		.91	142
		EQ-ERA	1,342	1,597	265,637		1.19	198
		Total	2,151	2,749	591,966	4,130	1.28	275
	Third	FS-Reg.	739	1,673	63,157		2.26	85
		EQ-ERA	648	777	59,040		1.20	91
		Total	1,387	2,450	122,197		1.77	88
	All Workings	EQ-Reg.	2,002	3,295	761,710	34,795	1.65	380
		FS-Reg.	3,554	2,832	396,154		.80	111
		EQ-NIRA	21,773	8,027	2,158,067		.37	99
		FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211
		EQ-ERA	44,303	22,760	3,617,348	1,330	.51	82
		FS-ERA	1,799	3,697	805,662	7,150	2.06	448
		F-ECW	10,248	5,457	841,068		.53	82
		Total	105,894	62,857	13,264,251	53,692	.60	125
Idaho Washington Montana	First	EQ-Reg.	45,955	17,510	4,375,372	30,665	.38	95
		FS-Reg.	108,267	107,049	30,293,756	218,820	.99	280
		EQ-NIRA	109,881	57,654	19,920,997	24,200	.52	181
		FS-NIRA	327,024	190,134	55,825,118	123,587	.58	171
		EQ-ERA	364,678	251,296	61,861,284	120,046	.69	170
		FS-ERA	26,547	25,959	6,119,483	7,150	.98	231
		Cooperative	207,449	98,270	29,812,084	339,769	.47	144
		F-ECW	348,087	379,919	77,703,796	304,967	1.09	223
		S&P-ECW	166,813	127,659	26,122,385	234,341	.77	157
		Total	1,704,701	1,255,450	312,034,275	1,403,545	.74	183
	Second	EQ-Reg.	619	980	299,410	4,130	1.58	484
		FS-Reg.	20,450	14,694	3,054,008	23,805	.72	149
		EQ-NIRA	2,818	1,888	451,021	3,355	.67	160
		FS-NIRA	16,342	7,262	966,499	8,007	.44	59
		EQ-ERA	32,376	24,927	4,062,735	5,614	.77	126
		FS-ERA	6,389	5,354	613,094		.84	96
		Cooperative	5,579	3,318	624,259	13,227	.59	112
		F-ECW	14,954	26,256	3,158,298	39,397	1.76	211
		S&P-ECW	6,434	7,704	863,262	43,750	1.20	134
		Total	105,961	92,383	14,112,586	141,285	.87	133
	Third	FS-Reg.	1,185	2,021	94,700		1.71	80
		FS-NIRA	914	747	127,700	1,922	.82	140
		EQ-ERA	1,020	1,229	126,572		1.20	124
		FS-ERA	108	133	8,014		1.23	74
		F-ECW	1,308	2,380	388,277	4,497	1.82	297
		S&P-ECW	366	162	17,305		.44	47
		Total	4,901	6,672	762,568	6,419	1.36	156
	All Workings	EQ-Reg.	46,574	18,490	4,674,782	34,795	.40	100
		FS-Reg.	129,902	123,764	33,442,464	242,625	.95	257
		EQ-NIRA	112,699	59,542	20,372,018	27,555	.53	181
		FS-NIRA	344,280	198,143	56,919,317	133,516	.58	165
		EQ-ERA	398,074	277,452	66,070,591	125,660	.70	166
		FS-ERA	33,044	31,446	6,740,591	7,150	.95	204
		Cooperative	213,028	101,588	30,436,343	352,996	.48	143
		F-ECW	364,349	408,555	81,250,371	349,861	1.12	223
		S&P-ECW	173,613	135,525	27,002,952	278,091	.78	156
		Total	1,815,563	1,354,505	326,909,429	1,551,249	.75	180

TABLE NO. 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1937
INLAND EMPIRE

State	Working	Number of Acres Worked by Ownership Classes					Total
		Federal			State	Private	
		Forest Service	Public Domain	Total			
Idaho	First	791,087	15,685	806,772	244,280	460,511	1,511,563
	Second	59,819	560	60,379	8,941	27,145	96,465
	Third	2,372	52	2,424	215	637	3,276
	Total	853,278	16,297	869,575	253,436	488,293	1,611,304
Washington	First	40,993	236	41,229	6,452	43,101	90,782
	Second	1,436		1,436	2,312	3,597	7,345
	Third				153	85	238
	Total	42,429	236	42,665	8,917	46,783	98,365
Montana	First	87,234		87,234	662	14,460	102,356
	Second	1,464		1,464		687	2,151
	Third	349		349		1,038	1,387
	Total	89,047		89,047	662	16,185	105,894
Total	First	919,314	15,921	935,235	251,394	518,072	1,704,701
	Second	62,719	560	63,279	11,253	31,429	105,961
	Third	2,721	52	2,773	368	1,760	4,901
	Total	984,754	16,533	1,001,287	263,015	551,261	1,815,563

TABLE NO. 10

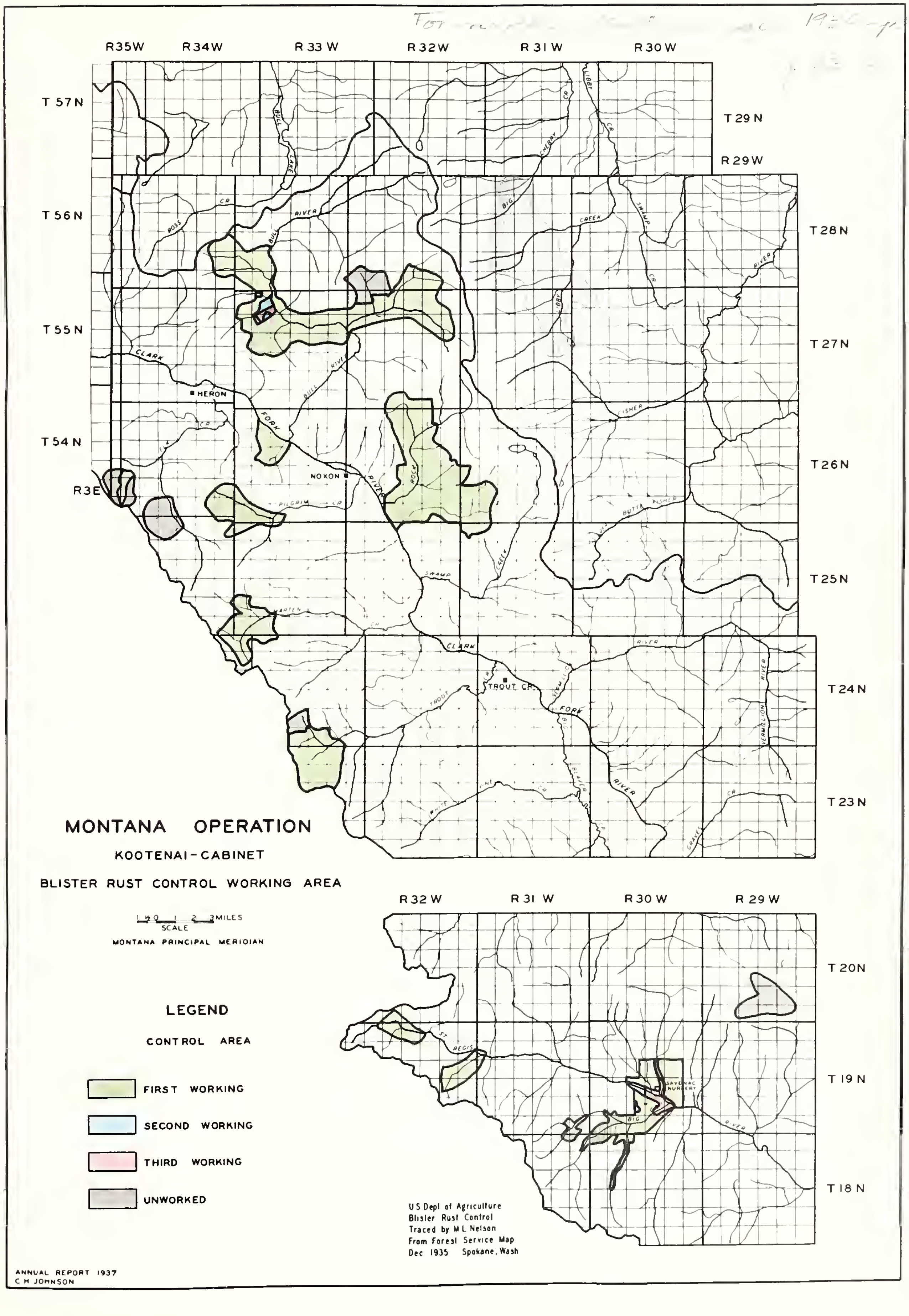
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1937
INLAND EMPIRE

State	Ownership Class	Number of Acres		
		Worked	Unworked	Total
Idaho	Forest Service	791,087	356,067	1,147,154
	Public Domain	15,685	22,135	37,820
	Sub-total Federal	806,772	378,202	1,184,974
	State	244,280	126,967	371,247
	Private	460,511	390,456	850,967
	Total	1,511,563	895,625	2,407,188
Washington	Forest Service	40,993	50,440	91,433
	Public Domain	236	20	256
	Sub-total Federal	41,229	50,460	91,689
	State	6,452	1,255	7,707
	Private	43,101	5,994	49,095
	Total	90,782	57,709	148,491
Montana	Forest Service	87,234	50,285	137,519
	State	662		662
	Private	14,460	1,809	16,269
	Total	102,356	52,094	154,450
Total	Forest Service	919,314	456,792	1,376,106
	Public Domain	15,921	22,155	38,076
	Sub-total Federal	935,235	478,947	1,414,182
	State	251,394	128,222	379,616
	Private	518,072	398,259	916,331
	Total	1,704,701	1,005,428	2,710,128

TABLE NO. 11

TOTAL RIBES BY SPECIES ERADICATED, 1923-1937
INLAND EMPIRE

Working	Eradication Type	Acres	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes laxiflorum	Ribes triste	Ribes acerifolium	Total Ribes
First	Open Reproduction	409,545	35,904,046	101,533,665	170,207	1,038,524	446,964		1,145		139,094,551
	Dense Reproduction	88,734	2,768,605	2,480,167	15,767	104,631	34,703	2,215			5,406,088
	Open Pole	242,443	10,084,409	9,128,575	62,567	336,637	209,195		462	3,914	19,825,759
	Dense Pole	67,323	1,405,072	846,003	1,651	36,301	10,420				2,299,447
	Open Mature	631,448	40,873,013	20,994,927	223,629	362,448	333,486	7,069	26	2,027	62,796,625
	Dense Mature	66,905	788,188	229,697	1,104	42,382	2,839	172			1,064,382
	Cut Over	44,148	5,072,703	9,658,304	43,873	88,469	38,715				14,902,064
	Brush	23,220	1,404,729	2,906,268	19,257	97,116	20,164				4,447,534
	Burn	9,859	673,408	2,671,330	8,895	18,433	9,292				3,381,358
	Subalpine	2,935	305,500	136,917		19					442,436
	Meadow-Field	2,401	5,010			7,121					12,131
	All Upland	1,588,961	99,284,683	150,585,853	546,950	2,132,081	1,105,778	9,456	1,633	5,941	253,672,375
	Stream	115,740	38,109,140	1,789,655	5,968,014	12,327,317	98,060	31,619	18,511	19,584	58,361,900
	All Types	1,704,701	137,393,823	152,375,508	6,514,964	14,459,398	1,203,838	41,075	20,144	25,525	312,034,275
Second	Open Reproduction	22,934	1,166,735	2,069,004	5,801	37,267	13,016				3,291,823
	Dense Reproduction	2,691	118,291	31,238	4	1,529					151,062
	Open Pole	16,533	587,748	319,239	8,427	13,835	921				930,170
	Dense Pole	2,038	33,992	9,863		2,761					46,616
	Open Mature	20,954	873,987	635,319	13,374	14,385	6,841				1,543,906
	Dense Mature	1,095	40,702	1,894		658					43,254
	Cut Over	9,876	556,300	1,101,455	18,256	18,690					1,694,701
	Brush	1,781	31,702	123,032		875					155,609
	Subalpine	218	4,819	4,022							8,841
	All Upland	78,120	3,414,276	4,295,066	45,862	90,000	20,778				7,865,982
	Stream	27,841	3,398,511	259,018	1,210,279	1,368,471	10,325				6,246,604
	All Types	105,961	6,812,787	4,554,084	1,256,141	1,458,471	31,103				14,112,586
Third	Open Reproduction	212	34,694	27,518			200				62,412
	Open Pole	91	1,426	5,399			6				6,831
	Dense Pole	12		60							60
	Open Mature	9	54	100							154
	Cut Over	48	8,578	3,875							12,453
	Brush	15	140	298							438
	All Upland	387	44,892	37,250			206				82,348
	Stream	4,514	342,876	14,153	167,242	155,949					680,220
	All Types	4,901	387,768	51,403	167,242	155,949	206				762,568
All Workings	Open Reproduction	432,691	37,105,475	103,630,187	176,008	1,075,791	460,180		1,145		142,448,786
	Dense Reproduction	91,425	2,886,896	2,511,405	15,771	106,160	34,703	2,215			5,557,150
	Open Pole	259,067	10,673,583	9,453,213	70,994	350,472	210,122		462	3,914	20,762,760
	Dense Pole	69,373	1,439,064	855,926	1,651	39,062	10,420				2,346,123
	Open Mature	652,411	41,747,054	21,630,346	237,003	376,833	340,327	7,069	26	2,027	64,340,685
	Dense Mature	68,000	828,890	231,591	1,104	43,040	2,839	172			1,107,636
	Cut Over	54,072	5,637,581	10,763,634	62,129	107,159	38,715				16,609,218
	Brush	25,016	1,436,571	3,029,598	19,257	97,991	20,164				4,603,581
	Burn	9,859	673,408	2,671,330	8,895	18,433	9,292				3,381,358
	Subalpine	3,153	310,319	140,939		19					451,277
	Meadow-Field	2,401	5,010			7,121					12,131
	All Upland	1,667,468	102,743,851	154,918,169	592,812	2,222,081	1,126,762	9,456	1,633	5,941	261,620,705
	Stream	148,095	41,850,527	2,062,826	7,345,535	13,851,737	108,385	31,619	18,511	19,584	65,288,724
	All Types	1,815,563	144,594,378	156,980,995	7,938,347	16,073,818	1,235,147	41,075	20,144	25,525	326,909,429



MONTANA OPERATION
KOOTENAI-CABINET
BLISTER RUST CONTROL WORKING AREA
SCALE
MONTANA PRINCIPAL MERIDIAN
LEGEND
CONTROL AREA
FIRST WORKING
SECOND WORKING
THIRD WORKING
UNWORKED
R35W
R34W
R 33 W
R 32 W
R 31 W
R 30 W
R 29 W
T 57 N
T 56 N
T 55 N
T 54 N
R3E
T 29 N
T 28 N
T 27 N
T 26 N
T 25 N
T 24 N
T 23 N
T 20 N
T 19 N
T 18 N
HERON
NOXON
TROUT CR.
CLARK FORK
BULL RIVER
ROSS CR
LIBBY CR
CHERRY CR
BIG CREEK
SWAMP CR
FISHER RIVER
ROCK CR
PILGRIM CR
VERMILLION RIVER
ST REGIS
BIG RIVER
SAVENAC NURSERY
US Dept of Agriculture
Blister Rust Control
Traced by M L Nelson
From Forest Service Map
Dec 1935 Spokane, Wash
ANNUAL REPORT 1937
C H JOHNSON

[illegible]

by

[illegible]

INTRODUCTION

The [illegible] for the [illegible] was [illegible] allotted to the Forest Service and the Bureau of Entomology and Plant Quarantine under the [illegible] Act. [illegible] operations [illegible] curtailed. [illegible] camps were confined to the [illegible] portion of the [illegible] where [illegible]

A [illegible] camp [illegible] established by the Bureau of Entomology and Plant Quarantine for winter work was [illegible] on April [illegible]. Additional camps [illegible] were established in June, but due to a sharp [illegible] in the [illegible] for field work it became necessary to withdraw the [illegible]

Effective July 1 the Forest Service assumed [illegible] control on areas under their administration. As stated in the [illegible] agreement, the two organizations continued to function [illegible] in all matters pertaining to the control [illegible]

A [illegible]-man camp continued eradication until [illegible] in the use of [illegible] and the clearing of [illegible] bulldozer made possible a long field season.

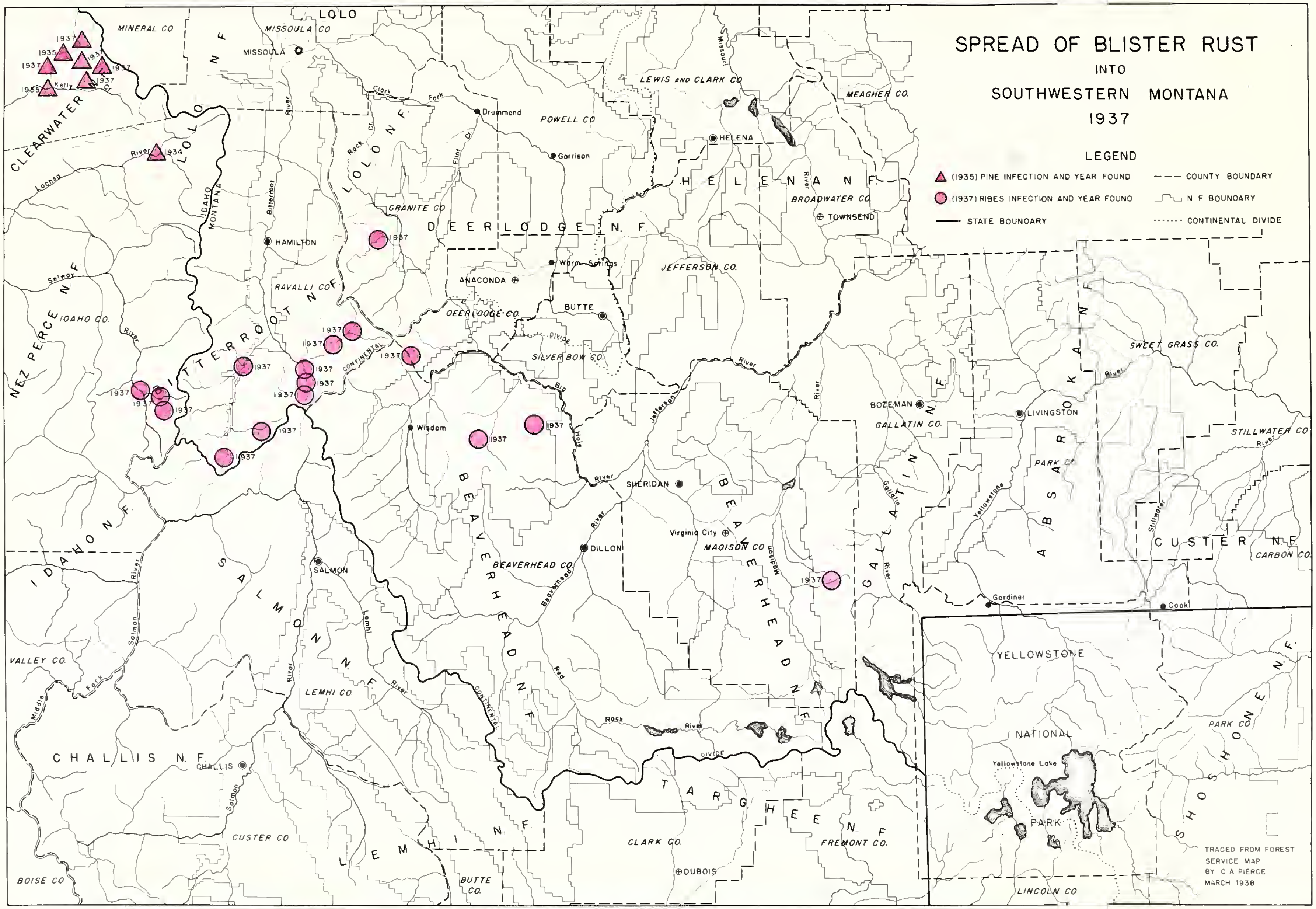
Conditions were extremely favorable for the spread of [illegible] Infection on ribes was found scattered throughout the [illegible] during area of the [illegible] National Forest.

[illegible] infection was found for the first time in the [illegible] Keeler [illegible] Districts of the [illegible] National Forest.

LOCATION AND DESCRIPTION OF AREA

Camps were established on the [illegible], West and [illegible] Creek. Along these drainages there are [illegible] of [illegible] stands of the reproduction, pole and mature classes of timber.

The area drained by the St. Regis River is [illegible] pine, consequently [illegible] stands [illegible] [illegible] [illegible] [illegible] constitute the [illegible] forest in the region.



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Defoliated ribes. Conspicuous when marked with white mechanics waste.

[illegible]

[illegible] in this fashion. The tabulation on the following page [illegible] application by the use of tagging as compared with [illegible] regular summer application. [illegible] time and tagging time [illegible] and the direction of [illegible]

As a result of this slight departure from regular [illegible] facts were brought to light from which certain [illegible] appear reasonable.

[illegible] applied and [illegible] changes in weather conditions. [illegible] both satisfactorily [illegible] produce satisfactory [illegible]

Tagging constitutes a method [illegible] has been commonly viewed as uneconomical. In the light of [illegible] time required to tag [illegible] time by the tagging method must necessarily be [illegible] in the past has been commonly recognized as searching time. [illegible] has been regarded as the searching time [illegible] tagging time is a way of comparison [illegible] A tagged bush reduces [illegible] time [illegible]

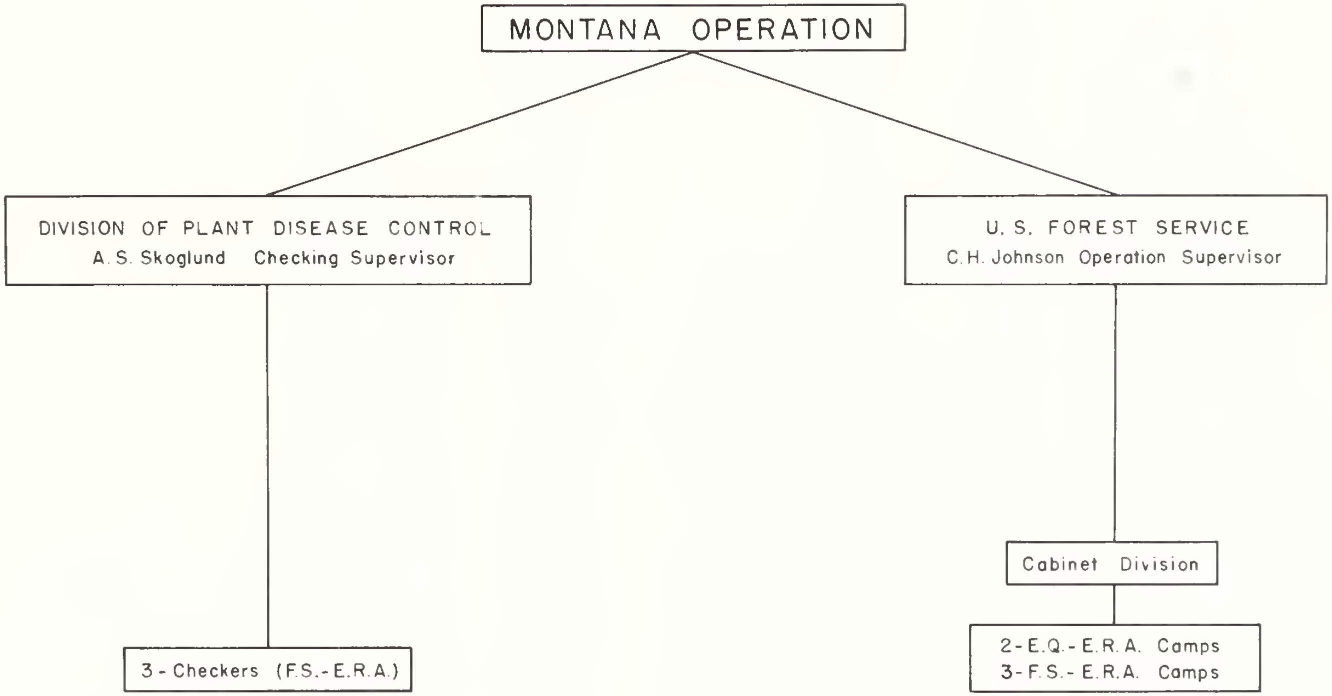
During the [illegible] season it was the good fortune to [illegible] and checkers with [illegible] that a [illegible] fashion was [illegible] preciation of the [illegible] test field activity.

[illegible] form a conspicuous part of all [illegible] Wherever it was [illegible] a bulldozer was used to [illegible] posal of heavy patches of [illegible] cleared by means of the bulldozer a mixture of Timothy [illegible] Kentucky Blue grass was [illegible] to establish a [illegible]

RESULTS OF LATE ERADICATION BY THE USE OF TAGGING AS COMPARED WITH EQUAL AND SIMILAR AREAS OF REGULAR SUMMER ERADICATION

Plot No.	Location and Direction of Work	Size of Plot Acres	Working Conditions and Ribes Species	Strip No. and Size of Strips	Method Used	Time: Tagging Hrs.	Time: Tagging Min.	Time: Eradicating Hrs.	Time: Eradicating Min.	Time: Total Time Hrs.	Time: Total Time Min.	Ratio Between Tagging and Pulling	Contrast as to Ribes Tagged and Reported by Eradicators	Date of Eradication	Temperature	Visibility	Type of Labor	Results of Rework	Remarke
I.	Middle Fork Big Creek Up and down slope	2.8	Heavy R. viscosissimum R. lacuetre R. irriguum	#2-.7A #4-.7A	Tagged Tagged	15	45	67	30	83	15	1 to 4.3	2,305 ribes recorded as tagged on strips 2 & 4	10/4-7	10/4 - 56° 10/5 - 56° 10/6 - 62° 10/7 - 68°	Good	ERA		Tagging performed by 3-man crew. Clumps of bushes limited to a few markers, hence higher count by eradicators.
				#1-.7A #3-.7A	Not tagged Not tagged			85		85			3,271 ribes recorded by eradicators on strips 2 & 4 Strips 1 & 3 - 3,757 ribes	9/3-9	9/3 - 92° 9/4 - 90° 9/5 - 79° 9/6 - 73° 9/7 - 80° 9/8 - 85° 9/9 - 83°	Fair	ERA		Ribes count by eradicators found to be consistently high.
II.	Middle Fork Big Creek	4	Very heavy	#1- 2A	Not tagged			49	30	49	30		1,087 ribes	9/1&2	9/1 - 85° 9/2 - 85°	Poor	ERA	65 bushes missed	
	On contour		R. viscosissimum	#2- 2A	Tagged	6		34	30	40	30	1 to 5.7	760 ribes recorded as tagged 850 ribes recorded by eradicators	10/5&6	10/5 - 56° 10/6 - 62°	Fair	ERA	32 bushes, including 3 tagged bushes, missed	Tagging performed by one man following a zigzag course. 1-man crew not recommended beceuse of hard and exacting effort necessary to cover all of ground.
III.	Middle Fork Big Creek Yellow pine plantation Up and down slope	6	Light R. viecosissimum		Tagged	9	45	49		58	45	1 to 5	1,632 ribes recorded as tagged 1,748 ribes reported by eradicators	10/1	10/1 - 56°	Good			
All Areas Tagged	Middle Fork Big Creek	50	Heavy		Tagged	409		1,963		2,372		1 to 4.8							

ORGANIZATION CHART



E. Q. - E.R.A.
†Number of Camps - 2
1 - 60 - Man Camp
1 - 20 - Man Camp
Number of Men - 80

F. S. - E.R.A.
Number of Camps - 3
1 - 60 - Man Camp
2 - 30 - Man Camp
Number of Men - 120

Total Number of Men on Blister Rust Work - 200
†Transfered to Forest Service July 1.

[illegible]

[illegible]

Until July 1 [illegible] were [illegible] operated [illegible] Forest Service and the Bureau of Entomology and Plant Quarantine [illegible] arrangements as [illegible] in the past. Effective July 1 all camps [illegible] by the Forest Service with CCC funds. With the [illegible] of [illegible] supervisory personnel to the Forest Service, there were no [illegible]. The Bureau of Entomology continued to assist and [illegible] maintenance of rigid standards previously established and [illegible] to a proper execution of control work.

Field headquarters were established at a regular [illegible] from which supplies were consigned to other camps in the [illegible].

CHECKING

The checking organization performed in a manner similar to [illegible] year in assisting the eradication forces to the fullest extent.

An advance check was made on all areas worked during the [illegible] season in addition to 7,000 acres to be worked in the future.

The regular check was performed on 3,252 acres at an [illegible] of $.055 per acre.

A post check was made on 679 acres worked in 1934 and [illegible] check 251 acres have been placed on a maintenance basis with 428 acres needing additional work. The cost per acre of the post check was [illegible] acre.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the [illegible] tables by the [illegible] and the type of appropriation.

TABLE NO. 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1937
MONTANA OPERATION

Cooperating Agency	Appropriation	Amount
	Regular	$ 9,364.63
	ERA	27,005.46
Forest Service	Total	36,3[illegible].09
	Regular	3,918.94
Bureau of Entomology	ERA	[illegible]
and Plant Quarantine	Total	[illegible]
Total Expenditures	All Appropriations	[illegible]

TABLE NO. 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR [illegible]
MONTANA OPERATION

Item	Forest Service			Bureau of Entomology and Plant Quarantine			[illegible]
	Regular	ERA	Total	Regular	ERA	Total	
[illegible]	[illegible]		[illegible]	[illegible] 311 60	[illegible]	[illegible] 569 [illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]		[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		

[illegible]

Activity	Cooperating Agency	Funds	[illegible]
	FS-Reg.	$ 6,9[illegible]	
	FS-ERA	22,[illegible]	
	EQ-Reg.	2,818.94	
	EQ-ERA	9,[illegible].43	
FS and EQ-ERA	Total	42,566.11	[illegible]
	FS-Reg	2,440.89	
	FS-ERA	4,087.46	
[illegible]	Total	6,528.35	[illegible]
	EQ-Reg.	1,[illegible]	
	EQ-ERA	8,786.83	
EQ Winter Project	Total	9,886.63	[illegible]
Total Cost 1937 Operation		$58,[illegible].29	

[illegible]

SUMMARY OF RIBES ERADICATION, 1937
MONTANA OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Forest	Eradication Type	Acres First Working	Acres Second Working	Total Acres	Total Effective Man Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre	
								Bushes	Live Stem
Cabinet	Open Reproduction	1,266		1,266	1,734	448,491		4.2	12.1
	Open Pole	23		23	227	65,498			
	Dense Pole	84		84					
	Open Mature	193		193				.9	3.0
	Brush	332		332				1.9	14.0
	All Upland	1,898		1,898	1,961	513,989		3.3	10.9
	Stream (Hand)	276		276	1,587	500,334		13.2	25.3
	Stream (Chemical)	59		59	347	21,450	7,150		
	Stream (Slash)	16		16	65	8,000			
	Stream (Machine)	75		75	644	39,500			
	All Stream	367		367	2,643	569,284		13.2	25.3
	All Types	2,265		2,265	4,604	1,083,273		5.9	14.7
Savenac Nursery	Open Reproduction	449	75	524	89	17,051		.9	1.2
	Stream (Hand)	16		16	55	11,524			
	Stream (Machine)		15	15	36	3,000			
	All Stream	16	15	31	91	14,524		6.0	20.0
	All Types	465	90	555	180	31,575		1.1	2.1
All Forests	Open Reproduction	1,715	75	1,790	1,823	465,542		3.2	8.4
	Open Pole	23		23	227	65,498			
	Dense Pole	84		84					
	Open Mature	193		193				.9	3.0
	Brush	332		332				1.9	14.0
	All Upland	2,347	75	2,422	2,050	531,040		2.7	8.3
	Stream (Hand)	292		292	1,642	511,858		12.8	25.1
	Stream (Chemical)	59		59	347	21,450	7,150		
	Stream (Slash)	16		16	65	8,000			
	Stream (Machine)	75	15	90	680	42,500			
	All Stream	383	15	398	2,734	583,808		12.8	25.1
	All Types	2,730	90	2,820	4,784	1,114,848		4.9	11.9

TABLE NO. 3A - FIRST WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
						Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Cabinet	Open Reproduction	1,266	1,734	448,491		1.37	354		4.2	12.1
	Open Pole	23	227	65,498		9.87	2,848			
	Dense Pole	84								
	Open Mature	193							.9	3.0
	Brush	332							1.9	14.0
	All Upland	1,898	1,961	513,989		1.03	271		3.3	10.9
	Stream (Hand)	276	1,587	500,334		5.75	1,813		13.2	25.3
	Stream (Chemical)	59	347	21,450	7,150	5.88	364	121		
	Stream (Slash)	16	65	8,000		4.06	500			
	Stream (Machine)	75	644	39,500		8.59	527			
	All Stream	367	2,643	569,284		7.20	1,551		13.2	25.3
	All Types	2,265	4,604	1,083,273		2.03	478		5.9	14.7
Savenac Nursery	Open Reproduction	449	11	2,677		.02	6		.1	.5
	Stream (Hand)	16	55	11,524		3.44	720		6.0	20.0
	All Types	465	66	14,201		.14	31		.4	1.4
All Forests	Open Reproduction	1,715	1,745	451,168		1.02	263		2.9	8.4
	Open Pole	23	227	65,498		9.87	2,848			
	Dense Pole	84								
	Open Mature	193							.9	3.0
	Brush	332							1.9	14.0
	All Upland	2,347	1,972	516,666		.84	220		2.5	8.3
	Stream (Hand)	292	1,642	511,858		5.62	1,753			
	Stream (Chemical)	59	347	21,450	7,150	5.88	364	121		
	Stream (Slash)	16	65	8,000		4.06	500			
	Stream (Machine)	75	644	39,500		8.59	527			
	All Stream	383	2,698	580,808		7.04	1,516		12.8	25.1
	All Types	2,730	4,670	1,097,474		1.71	402		4.8	12.0

TABLE NO. 3B - SECOND WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
					Man Days	Ribes	Bushes	Live Stem
Savenac Nursery	Open Reproduction	75	78	14,374	1.04	192	8.0	8.7
	Stream (Machine)	15	36	3,000	2.40	200		
	All Types	90	114	17,374	1.27	193		

TABLE NO. [illegible]

[illegible]

Working	Class	Acres	Effective Mac. Days	Total [illegible]	Gallons [illegible]	[illegible]	[illegible]
First	[illegible]	856	691	252,312		.91	[illegible]
	[illegible]	1,799	3,697	805,662	7,150	2.06	[illegible]
	T5-Bulldozer	75	282	39,500		2.18	[illegible]
	Total	2,730	4,670	1,097,474	7,150	1.71	[illegible]
Second	[illegible]	75	78	14,374		1.04	[illegible]
	T5-Bulldozer	15	36	3,000		2.40	[illegible]
	Total	90	114	17,374		1.27	193
All Workings	[illegible]	931	769	266,686		.83	286
	[illegible]	1,799	3,697	805,662	7,150	2.06	446
	T5-Bulldozer	90	318	42,500		3.53	472
	Total	2,820	4,784	1,114,848	7,150	1.70	395

TABLE NO. 5

[illegible]
[illegible] OPERATION

State	Working	Number of Acres Worked					
		By Forest Service		By Bureau of Entomology and Plant Quarantine		Total	
		Forest Service	Private	Forest Service	Private	Forest Service	Private
Montana	First	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
	Second	15		75		[illegible]	
	Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1937
MONTANA OPERATION

		Average Results for All Areas														Areas with More Than 25 Feet Live Stem Per Acre		
				Ribes per Acre														
				Ribes lacustre		Ribes viscosissimum		Ribes petiolare		Ribes inerme		Ribes triste		All Species			Per Acre	
Forest	Eradication Type	Acres in Checked Area	Acres Checked	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Acres	Bushes	Live Stem
Cabinet	Open Reproduction	1,559	61.88	1.0	2.6	2.5	9.1	.6	.2	.1	.2			4.2	12.1	228	13	54
	Open Pole	23	1.20															
	Dense Pole	84	3.48															
	Open Mature	193	7.64	.6	1.0	.3	2.0							.9	3.0			
	Brush	332	13.20	.4	1.4	1.5	12.6							1.9	14.0	58	11	81
	All Upland	2,191	87.40	.8	2.1	2.0	8.5	.4	.2	.1	.1			3.3	10.9	283	13	59
	Stream	263	31.10	9.6	16.7			3.2	6.3	.2	1.2	.2	1.1	13.2	25.3	85	17	60
	All Types	2,454	118.50	3.0	5.9	1.5	6.3	1.2	1.8	.1	.4	.1	.3	5.9	14.7	368	14	60
Savenac Nursery	Open Reproduction	782	32.04	.1	.1	.8	1.1							.9	1.2			
	All Upland	782	32.04	.1	.1	.8	1.1							.9	1.2			
	Stream	16	1.50	6.0	20.0									6.0	20.0			
	All Types	798	33.54	.3	1.0	.8	1.1							1.1	2.1			
All Forest	Open Reproduction	2,341	93.92	.7	1.7	2.0	6.4	.4	.2	.1	.1			3.2	8.4	228	13	54
	Open Pole	23	1.20															
	Dense Pole	84	3.48															
	Open Mature	193	7.64	.6	1.0	.3	2.0							.9	3.0			
	Brush	332	13.20	.4	1.4	1.5	12.6							1.9	14.0	58	11	81
	All Upland	2,973	119.44	.6	1.6	1.7	6.5	.3	.1	.1	.1			2.7	8.3	283	13	59
	Stream	279	32.60	9.3	16.8			3.1	6.0	.2	1.2	.2	1.1	12.8	25.1	85	17	60
	All Types	3,252	152.04	2.5	4.9	1.3	5.1	.9	1.4	.1	.3	.1	.2	4.9	11.9	368	14	60

TABLE NO. [illegible]

TOTAL [illegible] BY SPECIES HARVESTED, [illegible]
MONTANA OPERATIONS

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
	[illegible]	[illegible]	[illegible]	[illegible]					
	[illegible]	[illegible]							
[illegible]	[illegible]	[illegible]							
	[illegible]	[illegible]							
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
	[illegible]	[illegible]	[illegible]	[illegible]	36,278	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	25	[illegible]	14,3[illegible]					
	[illegible]	15	[illegible]			[illegible]			
	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]			
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
	[illegible]	[illegible]	[illegible]	[illegible]					
	[illegible]	[illegible]							
[illegible]	[illegible]	[illegible]							
[illegible]	[illegible]	[illegible]							
	[illegible]	[illegible]	[illegible]	[illegible]					
	[illegible]	[illegible]	[illegible]	[illegible]					

SUMMARY OF RIBES ERADICATION, 1928-1937
MONTANA OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Forest	Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Total Effective Man Days	Total Ribes	Gallons Spray
Kootenai	Open Reproduction	7,867	107		7,974	4,323	687,269	
	Dense Reproduction	2,542			2,542	774	120,673	
	Open Pole	11,881	271		12,152	5,381	660,970	
	Dense Pole	3,515			3,515	229	15,607	
	Open Mature	7,331			7,331	2,953	421,462	
	Dense Mature	8,268			8,268	424	47,014	
	Brush	107			107	93	7,952	
	Burn	115			115	1	32	
	Meadow-Field	103			103	1		
	All Upland	41,729	378		42,107	14,179	1,960,979	
	Stream (Hand)	2,558	4		2,562	6,530	1,087,056	
	All Types	44,287	382		44,669	20,709	3,048,035	
Cabinet	Open Reproduction	19,220	355	99	19,674	12,135	3,294,801	
	Dense Reproduction	1,612			1,612	438	71,747	
	Open Pole	15,753	361	38	16,152	7,311	1,380,853	
	Dense Pole	2,593	153	12	2,758	966	211,681	
	Open Mature	6,811			6,811	3,206	882,971	
	Dense Mature	557			557	88	8,566	
	Brush	2,763			2,763	1,895	573,939	
	Meadow-Field	348			348	150	12,131	
	All Upland	49,657	869	149	50,675	26,189	6,436,689	
	Stream (Hand)	3,280	131		3,411	8,000	2,378,649	
	Stream (Chemical)	321			321	767	52,701	17,567
	Stream (Slash)	23			23	215	11,500	
	Stream (Machine)	75			75	644	39,500	
	All Stream	3,378	131		3,509	9,626	2,482,350	
	All Types	53,035	1,000		54,184	35,815	8,919,039	
Savenac Nursery	Open Reproduction	4,185	135		4,320	877	365,563	
	Dense Reproduction	102			102	3		
	All Upland	4,287	135		4,422	880	365,563	
	Stream (Hand)	747	619	1,238	2,604	3,732	685,724	
	Stream (Chemical)	237	62		299	875	200,390	36,125
	Stream (Slash)	45		40	85	810	42,500	
	Stream (Machine)		15		15	36	3,000	
	All Stream	747	634	1,238	2,619	5,453	931,614	
	All Types	5,034	769	1,238	7,041	6,333	1,297,177	
All Forests	Open Reproduction	31,272	597	99	31,968	17,335	4,347,633	
	Dense Reproduction	4,256			4,256	1,215	192,420	
	Open Pole	27,634	632	38	28,304	12,692	2,041,823	
	Dense Pole	6,108	153	12	6,273	1,195	227,288	
	Open Mature	14,142			14,142	6,159	1,304,433	
	Dense Mature	8,825			8,825	512	55,580	
	Brush	2,870			2,870	1,988	581,891	
	Burn	115			115	1	32	
	Meadow-Field	451			451	151	12,131	
	All Upland	95,673	1,382	149	97,204	41,248	8,763,231	
	Stream (Hand)	6,585	754	1,238	8,577	18,262	4,151,429	
	Stream (Chemical)	558	62		620	1,642	253,091	53,692
	Stream (Slash)	68		40	108	1,025	54,000	
	Stream (Machine)	75	15		90	680	42,500	
	All Stream	6,683	769	1,238	8,690	21,609	4,501,020	
	All Types	102,356	2,151	1,387	105,894	62,857	13,264,251	

TABLE NO. 8A - FIRST WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Kootenai	Open Reproduction	7,867	4,307	685,767		.55	87	
	Dense Reproduction	2,542	774	120,673		.30	47	
	Open Pole	11,881	5,249	651,861		.44	55	
	Dense Pole	3,515	229	15,607		.07	4	
	Open Mature	7,331	2,953	421,462		.40	57	
	Dense Mature	8,268	424	47,014		.05	6	
	Brush	107	93	7,952		.87	74	
	Burn	115	1	32		.01	1	
	Meadow-Field	103	1			.01		
	All Upland	41,729	14,030	1,950,368		.34	47	
	Stream (Hand)	2,558	6,526	1,086,811		2.55	425	
	All Types	44,287	20,556	3,037,179		.46	69	
Cabinet	Open Reproduction	19,220	10,944	3,054,120		.57	159	
	Dense Reproduction	1,612	438	71,747		.27	45	
	Open Pole	15,753	6,943	1,347,541		.44	86	
	Dense Pole	2,593	901	208,827		.35	81	
	Open Mature	6,811	3,206	882,971		.47	130	
	Dense Mature	557	88	8,566		.16	15	
	Brush	2,763	1,895	573,939		.69	208	
	Meadow-Field	348	150	12,131		.43	35	
	All Upland	49,657	24,565	6,159,842		.49	124	
	Stream (Hand)	3,280	7,759	2,361,275		2.37	720	
	Stream (Chemical)	321	767	52,701	17,567	2.39	164	55
	Stream (Slash)	23	215	11,500		9.35	500	
	Stream (Machine)	75	644	39,500		8.59	527	
	All Stream	3,378	9,385	2,464,976		2.78	730	
	All Types	53,035	33,950	8,624,818		.64	163	
Savenac Nursery	Open Reproduction	4,185	713	332,883		.17	80	
	Dense Reproduction	102	3			.03		
	All Upland	4,287	716	332,883		.17	78	
	Stream (Hand)	747	1,496	344,718		2.00	461	
	Stream (Chemical)	237	772	187,990	31,995	3.26	793	135
	Stream (Slash)	45	168	22,500		3.73	500	
	All Stream	747	2,436	555,208		3.26	743	
	All Types	5,034	3,152	888,091		.63	176	
All Forests	Open Reproduction	31,272	15,964	4,072,770		.51	130	
	Dense Reproduction	4,256	1,215	192,420		.29	45	
	Open Pole	27,634	12,191	1,999,402		.44	72	
	Dense Pole	6,108	1,130	224,434		.19	37	
	Open Mature	14,142	6,159	1,304,433		.44	92	
	Dense Mature	8,825	512	55,580		.06	6	
	Brush	2,870	1,988	581,891		.69	203	
	Burn	115	1	32		.01	1	
	Meadow-Field	451	151	12,131		.33	27	
	All Upland	95,673	39,311	8,443,093		.41	88	
	Stream (Hand)	6,585	15,781	3,792,804		2.40	576	
	Stream (Chemical)	558	1,539	240,691	49,562	2.76	431	89
	Stream (Slash)	68	383	34,000		5.63	500	
	Stream (Machine)	75	644	39,500		8.59	527	
	All Stream	6,683	18,347	4,106,995		2.75	615	
	All Types	102,356	57,658	12,550,088		.56	123	

TABLE NO. 8B - SECOND WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Kootenai	Open Reproduction	107	16	1,502		.15	14	
	Open Pole	271	133	9,109		.49	34	
	All Upland	378	149	10,611		.39	28	
	Stream (Hand)	4	4	245		1.00	61	
	All Types	382	153	10,856		.40	28	
Cabinet	Open Reproduction	355	841	198,346		2.37	559	
	Open Pole	361	273	27,506		.76	76	
	Dense Pole	153	61	2,794		.40	18	
	All Upland	869	1,175	228,646		1.35	263	
	Stream (Hand)	131	241	17,374		1.84	133	
	All Types	1,000	1,416	246,020		1.42	246	
Savenac Nursery	Open Reproduction	135	164	32,680		1.21	242	
	Stream (Hand)	619	877	287,010		1.42	464	
	Stream (Chemical)	62	103	12,400	4,130	1.66	200	67
	Stream (Machine)	15	36	3,000		2.40	200	
	All Stream	634	1,016	302,410		1.60	477	
	All Types	769	1,180	335,090		1.53	436	
All Forests	Open Reproduction	597	1,021	232,528		1.71	389	
	Open Pole	632	406	36,615		.64	58	
	Dense Pole	153	61	2,794		.40	18	
	All Upland	1,382	1,488	271,937		1.08	197	
	Stream (Hand)	754	1,122	304,629		1.49	404	
	Stream (Chemical)	62	103	12,400	4,130	1.66	200	67
	Stream (Machine)	15	36	3,000		2.40	200	
	All Stream	769	1,261	320,029		1.64	416	
	All Types	2,151	2,749	591,966		1.28	275	

TABLE NO. 8C - THIRD WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Cabinet	Open Reproduction	99	350	42,335	3.54	428
	Open Pole	38	95	5,806	2.50	153
	Dense Pole	12	4	60	.33	5
	All Upland	149	449	48,201	3.01	323
Savenac Nursery	Stream (Hand)	1,238	1,359	53,996	1.10	44
	Stream (Slash)	40	642	20,000	16.05	500
	All Stream	1,238	2,001	73,996	1.62	60
All Forests	Open Reproduction	99	350	42,335	3.54	428
	Open Pole	38	95	5,806	2.50	153
	Dense Pole	12	4	60	.33	5
	All Upland	149	449	48,201	3.01	323
	Stream (Hand)	1,238	1,359	53,996	1.10	44
	Stream (Slash)	40	642	20,000	16.05	500
	All Stream	1,238	2,001	73,996	1.62	60
	All Types	1,387	2,450	122,197	1.77	88

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1937
MONTANA OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis		
						Man Days	Ribes	Gallons Per Sprayed Area
First	EQ-Reg.	1,383	2,315	462,300	30,665	1.67	334	148
	FS-Reg.	2,625	987	306,078		.38	117	
	EQ-NIRA	21,773	8,027	2,158,067		.37	99	
	FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211	40
	EQ-ERA	42,313	20,386	3,292,671	1,330	.48	78	44
	FS-ERA	1,799	3,697	805,662	7,150	2.06	448	121
	F-ECW	10,248	5,457	841,068		.53	82	
	Total	102,356	57,658	12,550,088	49,562	.56	123	89
Second	EQ-Reg.	619	980	299,410	4,130	1.58	484	67
	FS-Reg.	190	172	26,919		.91	142	
	EQ-ERA	1,342	1,597	265,637		1.19	198	
	Total	2,151	2,749	591,966	4,130	1.28	275	67
Third	FS-Reg.	739	1,673	63,157		2.26	85	
	EQ-ERA	648	777	59,040		1.20	91	
	Total	1,387	2,450	122,197		1.77	88	
All Workings	EQ-Reg.	2,002	3,295	761,710	34,795	1.65	380	129
	FS-Reg.	3,554	2,832	396,154		.80	111	
	EQ-NIRA	21,773	8,027	2,158,067		.37	99	
	FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211	40
	EQ-ERA	44,303	22,760	3,617,348	1,330	.51	82	44
	FS-ERA	1,799	3,697	805,662	7,150	2.06	448	121
	F-ECW	10,248	5,457	841,068		.53	82	
	Total	105,894	62,857	13,264,251	53,692	.60	125	87

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1937
MONTANA OPERATION

Working	Number of Acres Worked by Ownership Classes			Total
	Forest Service	State - Montana	Private	
First	87,234	662	14,460	102,356
Second	1,464		687	2,151
Third	349		1,038	1,387
All Workings	89,047	662	16,185	105,894

TABLE NO. 11

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1937
MONTANA OPERATION

Ownership Classes	Number of Acres		
	Worked	Unworked	Total
Forest Service	87,234	50,285	137,519
State - Montana	662		662
Private	14,460	1,809	16,269
Total	102,356	52,094	154,450

TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1928-1937
MONTANA OPERATION

Working	Eradication Type	Acres	Ribes by Species							Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes laxiflorum	Ribes triste	
First	Open Reproduction	31,272	1,722,920	2,184,688	3,751	55,569	104,697		1,145	4,072,770
	Dense Reproduction	4,256	131,230	57,937			1,038	2,215		192,420
	Open Pole	27,634	1,094,564	746,043		84,642	74,153			1,999,402
	Dense Pole	6,108	130,061	77,785		8,179	8,409			224,434
	Open Mature	14,142	1,121,216	156,339		11,080	8,729	7,069		1,304,433
	Dense Mature	8,825	50,885	4,523				172		55,580
	Brush	2,870	285,698	285,771		5,260	5,162			581,891
	Burn	115	32							32
	Meadow-Field	451	5,010			7,121				12,131
	All Upland	95,673	4,541,616	3,513,086	3,751	171,851	202,188	9,456	1,145	8,443,093
	Stream	6,683	2,459,482	96,714	219,911	1,275,014	5,744	31,619	18,511	4,106,995
	All Types	102,356	7,001,098	3,609,800	223,662	1,446,865	207,932	41,075	19,656	12,550,088
Second	Open Reproduction	597	25,938	191,840		4,650	10,100			232,528
	Open Pole	632	15,436	18,152		2,106	921			36,615
	Dense Pole	153	801	1,708		285				2,794
	All Upland	1,382	42,175	211,700		7,041	11,021			271,937
	Stream	769	2,449	5	17,010	296,199	4,366			320,029
	All Types	2,151	44,624	211,705	17,010	303,240	15,387			591,966
Third	Open Reproduction	99	25,133	17,002			200			42,335
	Open Pole	38	800	5,000			6			5,806
	Dense Pole	12		60						60
	All Upland	149	25,933	22,062			206			48,201
	Stream	1,238	2,318		11,154	60,524				73,996
	All Types	1,387	28,251	22,062	11,154	60,524	206			122,197
All Workings	Open Reproduction	31,968	1,773,991	2,393,530	3,751	60,219	114,997		1,145	4,347,633
	Dense Reproduction	4,256	131,230	57,937			1,038	2,215		192,420
	Open Pole	28,304	1,110,800	769,195		86,748	75,080			2,041,823
	Dense Pole	6,273	130,862	79,553		8,464	8,409			227,288
	Open Mature	14,142	1,121,216	156,339		11,080	8,729	7,069		1,304,433
	Dense Mature	8,825	50,885	4,523				172		55,580
	Brush	2,870	285,698	285,771		5,260	5,162			581,891
	Burn	115	32							32
	Meadow-Field	451	5,010			7,121				12,131
	All Upland	97,204	4,609,724	3,746,848	3,751	178,892	213,415	9,456	1,145	8,763,231
	Stream	8,690	2,464,249	96,719	248,075	1,631,737	10,110	31,619	18,511	4,501,020
	All Types	105,894	7,073,973	3,843,567	251,826	1,810,629	223,525	41,075	19,656	13,264,251

[illegible]
[illegible]

by

[illegible]

[illegible] Pathologist

The method of tagging described in the [illegible] represents a feasible method for extending, if necessary, the [illegible] eradication season. It also represents a possible method of [illegible] cation on areas which because of very severe exposure to [illegible] of drinking water could be worked more effectively during the [illegible] climate in the fall. However, it is felt that more effective work [illegible] complished by the proper organization of the work plan without [illegible] the tagging method.

The Spokane Blister Rust Control Office can not [illegible] sults as set forth in the main body of the report in respect to [illegible] experiments. Additional data on areas on which the work was [illegible] not substantiate the results as set forth in the main body of [illegible] There are also other facts that should be considered in regard [illegible] bility of the plan.

Prolongation of the eradication season involves [illegible] in the pulling of ribes. After several frosts the ribes are [illegible] the cell walls of the plants hardening, tending to make them more [illegible] subject to breaking. The physiological setup of a plant is such [illegible] fall the roots are in direct possession of a capacity load of [illegible] Such is not the case during the spring and summer for this [illegible] carried upward, when activity starts in the spring, along with the [illegible] location of mineral salts and water to aerial portions of the plant [illegible] photosynthesis takes place. The root system, due to this stored [illegible] possesses a greater chance of survival when it is dormant in the [illegible] during the summer. Applying this to the pulling of ribes one [illegible] realize the danger in leaving roots with stem tissue as they would [illegible] to grow for awhile and in the spring send out shoots. In the [illegible] roots take in the mineral salts and water for the plant [illegible] tend to die due to lack of food in that part of the plant. [illegible] food is the reason that [illegible] is not so effective in [illegible] spring and summer. In frozen ground it is practically [illegible] bushes satisfactorily as the roots can not be pulled and [illegible] there are many of them left.

The following cases bear out the above statements. [illegible] worked late in the fall of 193[illegible] and during the summer of [illegible] over 400 feet of live stem per acre. This area was [illegible] in July 193[illegible] and apparently a very [illegible] there appeared 287 bushes per acre [illegible] left in the ground in 1936. On area [illegible] 1936 after frost and defoliation [illegible] 1937 [illegible] R. [illegible] pulled, [illegible] live stem each. It required 65 man [illegible] stem per acre.

[illegible] is [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] the results of a study [illegible] [illegible] searching on an area which supports only [illegible] ribes per acre [illegible] used in this tagging experiment which contains approximately [illegible] acre. An analysis of the experimental work performed by the [illegible] Control Office would show that the maximum time required for searching area supporting [illegible] ribes per acre should not exceed [illegible] in working that acre.

From the checking standpoint there is a [illegible] the fact the area can not be checked until the following year [illegible] [illegible] many ribes. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] the same year [illegible] will probably be [illegible] [illegible] [illegible] [illegible] of the areas [illegible] [illegible] [illegible] after the first working.

The [illegible] [illegible] [illegible] should be considered since [illegible] pounds of [illegible] [illegible] [illegible] per acre.

[illegible] tagging [illegible] the advantages of [illegible] year as [illegible] is produced prior to the time of defoliation [illegible] bushes are not pulled until later. This may be a minor point [illegible] [illegible] as the [illegible] [illegible].

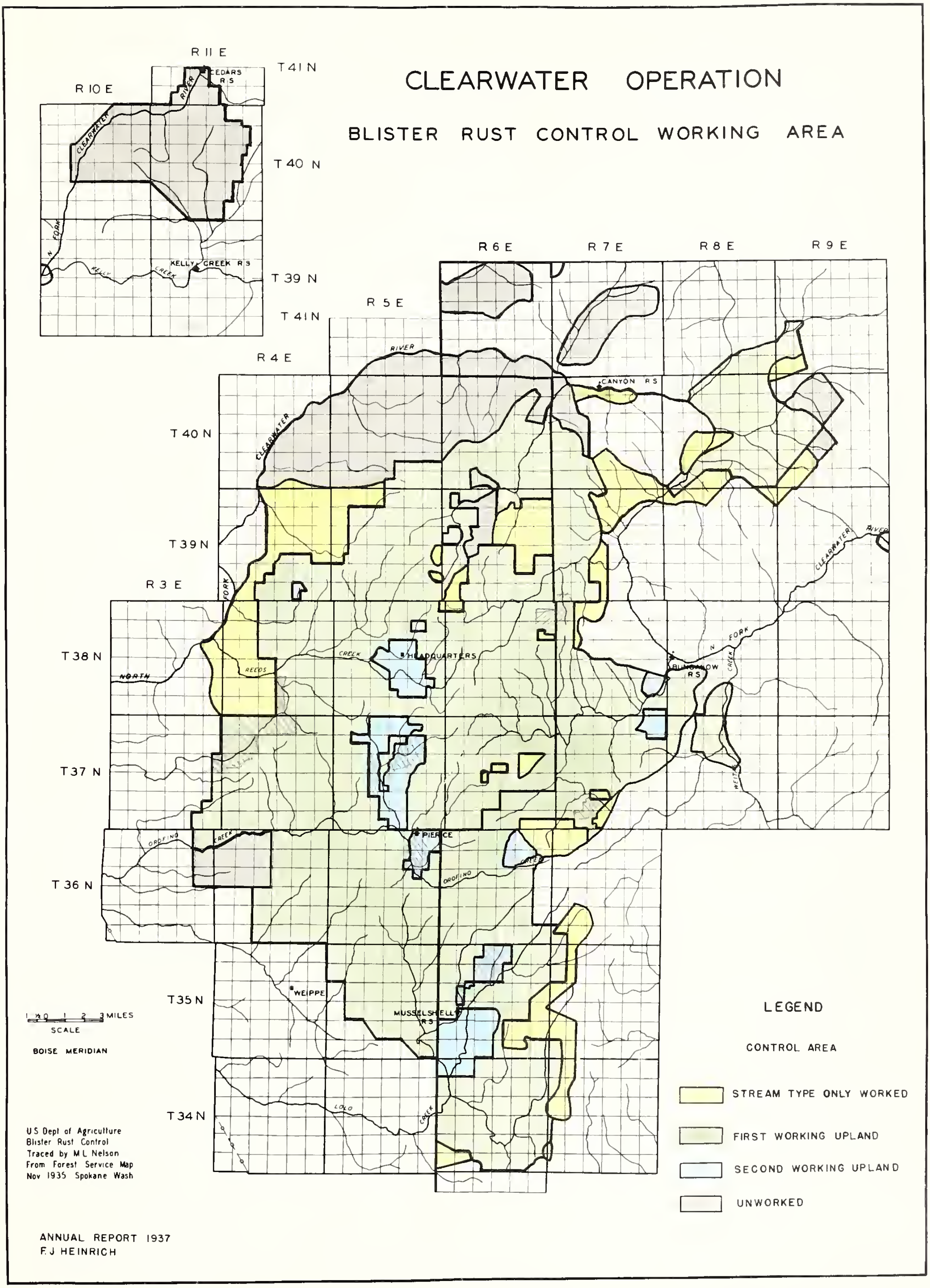
On one of the areas where tagging was done [illegible] after tagging to determine the number of bushes not [illegible] average was [illegible] not tagged and ran as high as [illegible] would seem very apparent that [illegible] bushes will [illegible] would [illegible] also be missed after defoliation [illegible] to look for [illegible] but the pulling [illegible]

The following data shows the results of the work [illegible] testing the tagging method. The results show a [illegible] [illegible] [illegible] in ribes [illegible] [illegible] [illegible] tagging method. Block No. [illegible] required only [illegible] man hours per acre as against [illegible] on blocks Nos. [illegible] and [illegible]. The [illegible] conditions [illegible] uniform as was [illegible] in [illegible] [illegible].

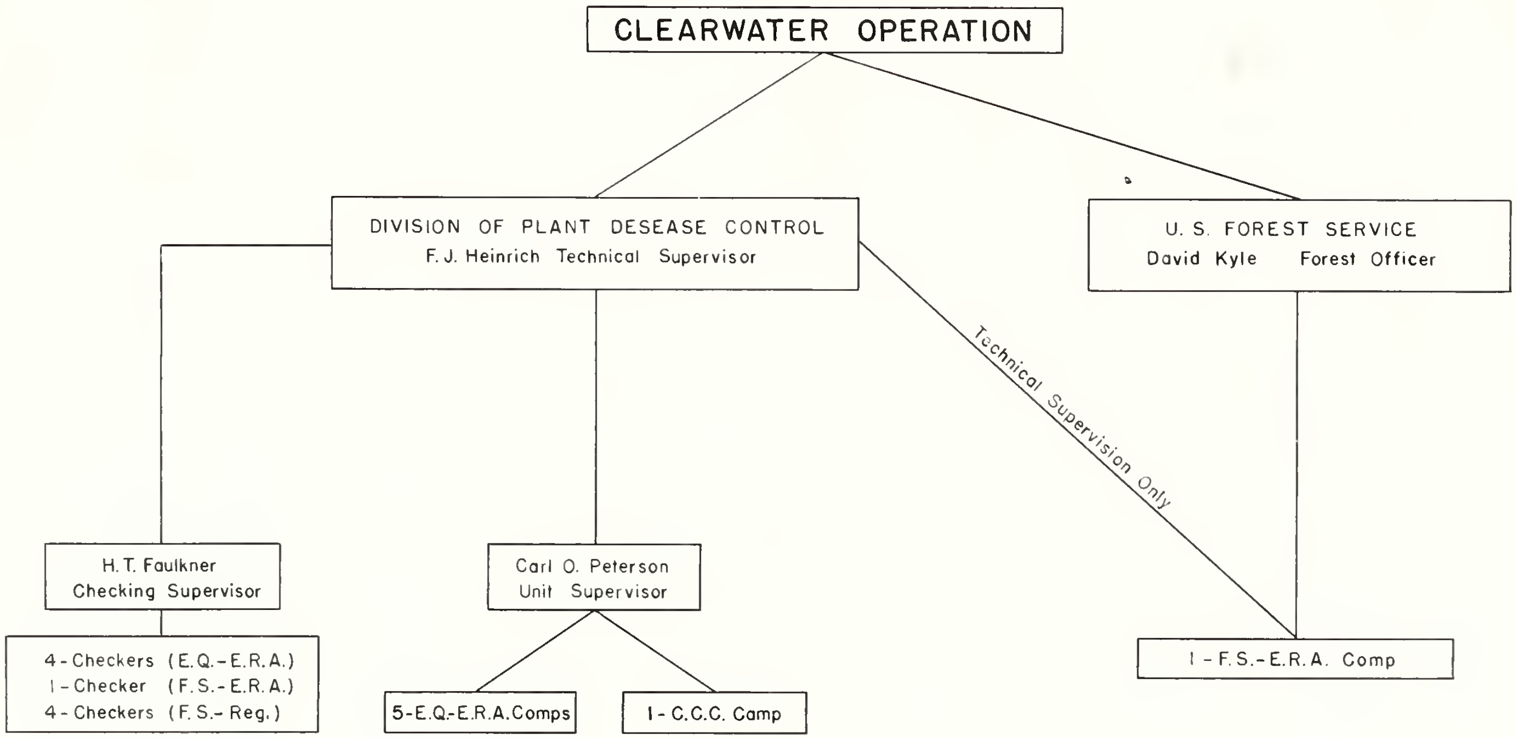
Block	Acres	[illegible]	[illegible]	[illegible]	[illegible]
No. 6 Not Tagged	15.6	[illegible]	[illegible]	[illegible]	[illegible]
No. 7 Tagged	8.3	59 (16 for tagging)	[illegible]168	1,95[illegible]	[illegible]
No. 8 Tagged	14.4	133 (27 for tagging)	29,656	[illegible]	[illegible]

CHECKING RESULTS OF STRIPS AFTER TAGGING AND BEFORE PULLING

Strip	Bushes Missed		Bushes	Total	Percent
	No.	P.L.S.	Tagged	Bushes	Not Tagged
70	106	530	[illegible]		
65	27	135	[illegible]	159	17
60	36	103	[illegible]		
56	25		[illegible]	144	[illegible]
55	[illegible]		[illegible]	107	12
50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
45	22	[illegible]	[illegible]	[illegible]	[illegible]
39	[illegible]		[illegible]	[illegible]	[illegible]
31	[illegible]		[illegible]	[illegible]	[illegible]
Average					[illegible]


CLEARWATER OPERATION
BLISTER RUST CONTROL WORKING AREA
R 11 E
R 10 E
T 41 N
T 40 N
T 39 N
CEDARS R S
KELLY CREEK R S
CLEARWATER
RIVER
N FORK
KELLY
CREEK
R 3 E
R 4 E
R 5 E
R 6 E
R 7 E
R 8 E
R 9 E
T 41 N
T 40 N
T 39 N
T 38 N
T 37 N
T 36 N
T 35 N
T 34 N
CANYON R S
HEADQUARTERS
BUNGALOW R S
PIERCE
WEIPPE
MUSSELSHELL R S
CLEARWATER
RIVER
FORK
NORTH
N FORK
WEITAS CREEK
RECDS
CREEK
OROFINO
CREEK
LOLO
CREEK
0 1 2 3 MILES
SCALE
BOISE MERIDIAN
LEGEND
CONTROL AREA
STREAM TYPE ONLY WORKED
FIRST WORKING UPLAND
SECOND WORKING UPLAND
UNWORKED
U S Dept of Agriculture
Blister Rust Control
Traced by M L Nelson
From Forest Service Map
Nov 1935 Spokane Wash
ANNUAL REPORT 1937
F J HEINRICH

ORGANIZATION CHART



E. Q. - E. R. A.
Number of Camps
4 - 90 - Man Camps
1 - 15 - Man Comp
Number of Men - 355

C. C. C.
Number of Comps
1 - 15% Camp
Number of Men - 20

F. S. - E. R. A.
Number of Comps - 1
Number of Men - 55

Total Number of Men on Blister Rust Work - 430

[illegible] in [illegible] the [illegible] to [illegible] period. [illegible] in advance of [illegible] work. [illegible] eradication [illegible] checking of eradication work.

One checker was assigned to each [illegible] camp [illegible] of the checking supervisor. The State Forest Service [illegible] checker to perform the regular checking work and assist [illegible] a [illegible]-man CCC crew engaged in ribes eradication during [illegible]

Funds were allocated by the U. S. Forest Service [illegible] appropriated for blister rust control to conduct a post check [illegible] owned lands where ribes eradication had been done previous [illegible] four men working approximately [illegible] months covered 30,[illegible] acres.

The classification of the areas post checked [illegible] a maintenance basis. The remaining [illegible] will require [illegible]

The regular checking force covered [illegible] acres at an [illegible] $.0[illegible] per acre. The average cost per acre for [illegible] the average cost for all types of checking $.0[illegible] per acre.

[illegible]

Areas were inspected throughout the summer to determine [illegible] A complete record was kept of the findings and these data will be [illegible] planning. It was found that [illegible] worked in previous years [illegible] free from mature ribes, but [illegible] have grown large enough [illegible] the hazard and should be removed during the 193[illegible] field season. [illegible] and survey was made of the [illegible] to determine the [illegible] work involved to protect the [illegible] acres of white pine. Ribes [illegible] found in abundance on [illegible] the [illegible] ribes [illegible] is believed that by removing the [illegible] a large [illegible] will be given with the minimum amount of work. An inspection [illegible] showed heavy infection on the [illegible] relatively free. The [illegible] very heavily infected and if [illegible] work is not done [illegible] the young white pine will [illegible] blister rust.

The 193[illegible] [illegible] survey covered an [illegible] the [illegible] operation. The [illegible] average conditions [illegible]

[illegible]

The [illegible] handled by the [illegible]

[illegible]

[illegible]

[illegible]	Occupants or Members: Average	Funds	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible] Check	[illegible]	[illegible]	
Total Cost [illegible] Operation		$166,501.80	

HQ-EMA

No. meals served 125,263   Average cost per meal $ [illegible]

Pounds of [illegible] 9,0[illegible]   Pounds of [illegible]

[illegible]

No. meals served [illegible]   Average cost per meal [illegible]

Pounds of [illegible] 195   Pounds of [illegible]

SUMMARY OF RIBES ERADICATION, 1937
CLEARWATER OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre	
								Bushes	Live Stem
Open Reproduction	2,077	893		2,970	6,122	1,497,563		6.4	23.4
Dense Reproduction	220	178		398	37	3,784		.2	1.3
Open Pole	1,659	1,975		3,634	1,757	323,557		2.3	8.1
Open Mature	6,969	1,610		8,579	6,863	1,270,201		2.4	9.8
Cut Over	120	2,675		2,795	2,536	1,041,384		6.1	15.5
Burn	472			472	368	132,914		8.3	20.8
Meadow-Field	242			242					
All Upland	11,759	7,331		19,090	17,683	4,269,403		3.5	12.2
Stream (Hand)	149	898	108	1,155	884	169,599			
Stream (Chemical)	12	344		356	371	12,501	4,167		
All Stream	149	898	108	1,155	1,255	182,100		3.7	14.0
All Types	11,908	8,229	108	20,245	18,938	4,451,503		3.6	12.5

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
					Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Open Reproduction	2,077	5,278	1,451,330		2.54	698		8.2	30.9
Dense Reproduction	220	35	3,769		.16	17		.4	2.4
Open Pole	1,659	1,177	269,160		.71	162		2.8	11.8
Open Mature	6,969	5,866	1,240,186		.84	178		2.8	11.5
Cut Over	120	592	385,097		4.93	3,209		11.0	18.0
Burn	472	368	132,914		.78	282		8.3	20.8
Meadow-Field	242								
All Upland	11,759	13,316	3,482,456		1.13	296		3.9	14.8
Stream (Hand)	149	129	37,202		.87	250			
Stream (Chemical)	12	28	2,790	930	2.33	233	78		
All Stream	149	157	39,992		1.05	268		3.9	20.3
All Types	11,908	13,473	3,522,448		1.13	296		3.9	15.3

TABLE NO. 3B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Open Reproduction	893	844	46,233		.95	52		2.5	7.5
Dense Reproduction	178	2	15		.01				
Open Pole	1,975	580	54,397		.29	28		1.9	5.0
Open Mature	1,610	997	30,015		.62	19		.7	2.8
Cut Over	2,675	1,944	656,287		.73	245		6.1	15.6
All Upland	7,331	4,367	786,947		.60	107		2.9	7.8
Stream (Hand)	898	622	124,383		.69	139			
Stream (Chemical)	344	343	9,711	3,237	1.00	28	9.4		
All Stream	898	965	134,094		1.07	149		4.6	11.5
All Types	8,229	5,332	921,041		.65	112		3.2	8.4

TABLE NO. 3C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Stream (Hand)	108	133	8,014		1.23	74		1.1	8.5
All Stream	108	133	8,014		1.23	74		1.1	8.5
All Types	108	133	8,014		1.23	74		1.1	8.5

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1937
CLEARWATER OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Per Sprayed Area
First	EQ-ERA	10,978	12,310	2,730,343	930	1.12	249	78
	FS-ERA	930	1,163	792,105		1.25	851	
	Total	11,908	13,473	3,522,443	930	1.13	296	
Second	EQ-ERA	3,665	2,899	787,376	3,237	.79	215	9.4
	FS-ERA	2,388	1,432	61,469		.60	26	
	S&P-ECW	2,176	1,001	72,194		.46	33	
	Total	8,229	5,332	921,041	3,237	.64	112	9.4
Third	FS-ERA	108	133	8,014		1.23	74	
	Total	108	133	8,014		1.23	74	
All Workings	EQ-ERA	14,643	15,209	3,517,721	4,167	1.04	240	11.7
	FS-ERA	3,426	2,728	861,588		.80	251	
	S&P-ECW	2,176	1,001	72,194		.46	33	
	Total	20,245	18,938	4,451,503	4,167	.94	220	11.7

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1937
CLEARWATER OPERATION

		Number of Acres Worked												
		By Forest Service		By Bureau of Entomology and Plant Quarantine					Total					
				Federal					Federal					
State	Working	Forest Service	Private	Forest Service	Public Domain	Total	State	Private	Forest Service	Public Domain	Total	State	Private	Total
Idaho	First	930		708	80	788	2,550	7,640	1,638	80	1,718	2,550	7,640	11,908
	Second	1,988	400	300		300	409	5,132	2,288		2,288	409	5,532	8,229
	Third	108							108		108			108
	Total	3,026	400	1,008	80	1,088	2,959	12,772	4,034	80	4,114	2,959	13,172	20,245

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1937
CLEARWATER OPERATION

	Average Results for All Areas												Areas With More Than 25 Feet Live Stem Per Acre		
			Ribes Per Acre												
			Ribes lacustre		Ribes viscosissimum		Ribes petiolare		Ribes irriguum		All Species			Per Acre	
Eradication Type	Acres in Checked Area	Acres Checked	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Acres	Bushes	Live Stem
Open Reproduction	2,762	110	1.8	5.0	4.3	17.1			.3	1.3	6.4	23.4	1,000	16	54
Dense Reproduction	398	16	.1	.4	.1	.9					.2	1.3			
Open Pole	3,620	146	1.5	5.3	.8	2.8					2.3	8.1	294	17	45
Open Mature	8,114	325	1.9	7.2	.5	2.6					2.4	9.8	964	16	58
Cut Over	2,014	81	.7	3.0	4.7	10.1	.7	2.4			6.1	15.5	307	83	88
Burn	485	20	3.6	9.9	4.7	10.9					8.3	20.8	162	16	60
Meadow-Field	242	10													
All Upland	17,635	708	1.6	5.8	1.7	5.9	.1	.3	.1	.2	3.5	12.2	2,727	23	58
Stream	390	107	3.0	10.4	.1	.1	.6	3.5			3.7	14.0	8	13	90
All Types	18,025	815	1.8	6.4	1.5	5.2	.2	.7	.1	.2	3.6	12.5	2,735	23	59

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1937
CLEARWATER OPERATION

			Ribes by Species					
Working	Eradication Type	Acres	Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Total Ribes
First	Open Reproduction	2,077	275,818	1,169,761	3,332		2,419	1,451,330
	Dense Reproduction	220	1,483	2,286				3,769
	Open Pole	1,659	231,446	36,228	1,486			269,160
	Open Mature	6,969	666,282	562,951	8,570		2,383	1,240,186
	Cut Over	120	65,400	318,358	1,339			385,097
	Burn	472	57,446	74,897	568		3	132,914
	Meadow-Field	242						
	All Upland	11,759	1,297,875	2,164,481	15,295		4,805	3,482,456
	Stream	149	36,945	119	2,928			39,992
	All Types	11,908	1,334,820	2,164,600	18,223		4,805	3,522,448
Second	Open Reproduction	893	7,848	37,474	911			46,233
	Dense Reproduction	178	5	10				15
	Open Pole	1,975	13,261	38,175	2,961			54,397
	Open Mature	1,610	14,711	13,194	1,994	116		30,015
	Cut Over	2,675	58,871	594,867	2,549			656,287
	All Upland	7,331	94,696	683,720	8,415	116		786,947
	Stream	898	45,610	2,306	81,971	4,207		134,094
	All Types	8,229	140,306	686,026	90,386	4,323		921,041
Third	Stream (Hand)	108	3,247	933	3,442	392		8,014
	All Stream	108	3,247	933	3,442	392		8,014
	All Types	108	3,247	933	3,442	392		8,014
All Workings	Open Reproduction	2,970	283,666	1,207,235	4,243		2,419	1,497,563
	Dense Reproduction	398	1,488	2,296				3,784
	Open Pole	3,634	244,707	74,403	4,447			323,557
	Open Mature	8,579	680,993	576,145	10,564	116	2,383	1,270,201
	Cut Over	2,795	124,271	913,225	3,888			1,041,384
	Burn	472	57,446	74,897	568		3	132,914
	Meadow-Field	242						
	All Upland	19,090	1,392,571	2,848,201	23,710	116	4,805	4,269,403
	Stream	1,155	85,802	3,358	88,341	4,599		182,100
	All Types	20,245	1,478,373	2,851,559	112,051	4,715	4,805	4,451,503

SUMMARY OF RIBES ERADICATION, 1929-1937
CLEARWATER OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Total Effective Man Days	Total Ribes	Gallons Spray
Open Reproduction	55,349	4,672		60,021	93,323	29,917,276	
Dense Reproduction	11,088	411		11,499	5,243	1,162,807	
Open Pole	25,441	2,315		27,756	15,906	3,664,992	
Dense Pole	3,534			3,534	937	185,062	
Open Mature	213,448	10,091		223,539	102,446	23,517,957	
Dense Mature	5,309	272		5,581	509	131,274	
Cut Over	27,726	7,394		35,120	31,504	11,805,392	
Brush	2,795	79		2,874	2,578	732,633	
Burn	1,045			1,045	1,246	917,609	
Subalpine	122			122	118	53,948	
Meadow-Field	1,890			1,890			
All Upland	347,747	25,234		372,981	253,810	72,088,950	
Stream (Hand)	40,920	13,374	1,765	56,059	52,374	12,684,560	
Stream (Chemical)	14,180	3,689	63	17,932	33,181	2,436,861	812,087
Stream (Slash)	65	13		78	1,258	188,983	
All Stream	41,425	13,666	1,765	56,856	86,813	15,310,404	
All Types	389,172	38,900	1,765	429,837	340,623	87,399,354	

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Open Reproduction	55,349	90,384	29,558,587		1.63	53	
Dense Reproduction	11,088	5,214	1,161,593		.47	105	
Open Pole	25,441	15,201	3,600,567		.60	142	
Dense Pole	3,534	937	185,062		.27	52	
Open Mature	213,448	98,791	23,136,631		.46	108	
Dense Mature	5,309	493	130,871		.09	25	
Cut Over	27,726	25,888	10,610,089		.93	383	
Brush	2,795	2,536	729,247		.91	261	
Burn	1,045	1,246	917,609		1.19	878	
Subalpine	122	118	53,948		.97	442	
Meadow-Field	1,890						
All Upland	347,747	240,808	70,084,204		.69	202	
Stream (Hand)	40,920	43,152	10,996,198		1.05	269	
Stream (Chemical)	14,180	29,512	2,277,611	758,937	2.08	161	53.5
Stream (Slash)	65	1,233	188,983		18.97	2,907	
All Stream	41,425	73,897	13,462,792		1.78	325	
All Types	389,172	314,705	83,546,996		.81	215	

TABLE NO. 8B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Open Reproduction	4,672	2,939	358,689		.63	77	
Dense Reproduction	411	29	1,214		.07	3	
Open Pole	2,315	705	64,425		.30	28	
Open Mature	10,091	3,655	381,326		.36	38	
Dense Mature	272	16	403		.06	1.5	
Cut Over	7,394	5,616	1,195,303		.76	162	
Brush	79	42	3,386		.53	43	
All Upland	25,234	13,002	2,004,746		.52	79	
Stream (Hand)	13,374	8,008	1,512,424		.60	113	
Stream (Chemical)	3,689	3,555	153,484	51,228	.96	42	.88
Stream (Slash)	13	25			1.96		
All Stream	13,666	11,588	1,665,908		.84	121	
All Types	38,900	24,590	3,670,654		.63	94	

TABLE NO. 8C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Stream (Hand)	1,765	1,214	175,938		.69	100	
Stream (Chemical)	63	114	5,766	1,922	1.81	92	31
All Stream	1,765	1,328	181,704		.75	103	
All Types	1,765	1,328	181,704		.75	103	

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1937
CLEARWATER OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Per Acre Basis: Ribes	Per Acre Basis: Gallons Per Sprayed Area
First	FS-Reg.	9,423	11,342	4,209,393	15,057	1.20	447	76
	EQ-NIRA	19,009	12,345	5,679,694	13,361	.65	299	69
	FS-NIRA	41,460	33,021	12,605,276	11,694	.80	304	79
	EQ-ERA	62,308	60,302	14,725,709	75,622	.97	236	77
	FS-ERA	2,150	3,198	1,350,528		1.48	628	
	Cooperative	91,453	59,665	18,267,124	283,158	.65	200	36
	F-ECW	65,023	58,358	12,622,626	148,294	.90	194	62
	S&P-ECW	98,346	76,474	14,086,646	211,751	.78	143	87
	Total	389,172	314,705	83,546,996	758,937	.81	215	53
Second	FS-Reg.	6,609	1,389	165,228		.21	25	
	EQ-NIRA	1,076	660	159,890	3,355	.61	149	45
	FS-NIRA	2,498	2,342	175,212	8,007	.93	70	21
	EQ-ERA	14,305	9,750	1,684,159	3,237	.68	118	9.4
	FS-ERA	2,388	1,432	61,469		.60	26	
	Cooperative	4,843	2,898	553,110	10,553	.60	114	3
	F-ECW	2,995	2,772	463,923	11,278	.92	155	33
	S&P-ECW	4,186	3,347	407,663	14,798	.79	97	39
	Total	38,900	24,590	3,670,654	51,228	.63	94	11
Third	FS-Reg.	446	348	31,543		.78	71	
	FS-NIRA	914	747	127,700	1,922	.82	140	30
	FS-ERA	108	133	8,014		1.23	74	
	S&P-ECW	297	100	14,447		.34	49	
	Total	1,765	1,328	181,704	1,922	.75	103	30
All Workings	FS-Reg.	16,478	13,079	4,406,164	15,057	.79	267	76
	EQ-NIRA	20,085	13,005	5,839,584	16,716	.65	291	64
	FS-NIRA	44,872	36,110	12,908,188	21,623	.80	288	36
	EQ-ERA	76,613	70,052	16,409,868	78,859	.91	214	59
	FS-ERA	4,646	4,763	1,420,011		1.02	306	
	Cooperative	96,296	62,563	18,820,234	293,711	.65	195	27
	F-ECW	68,018	61,130	13,066,549	159,572	.90	192	58
	S&P-ECW	102,829	79,921	14,508,756	226,549	.78	141	81
	Total	429,837	340,623	87,399,354	812,087	.79	203	42

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1937
CLEARWATER OPERATION

Working	Number of Acres Worked by Ownership Classes: Federal: Forest Service	Federal: Public Domain	Federal: Total	State - Idaho	Private	Total
First	144,590	3,680	148,270	78,662	162,240	389,172
Second	21,703	160	21,863	3,165	13,872	38,900
Third	1,539		1,539	100	126	1,765
All Workings	167,832	3,840	171,672	81,927	176,238	429,837

TABLE NO. 11

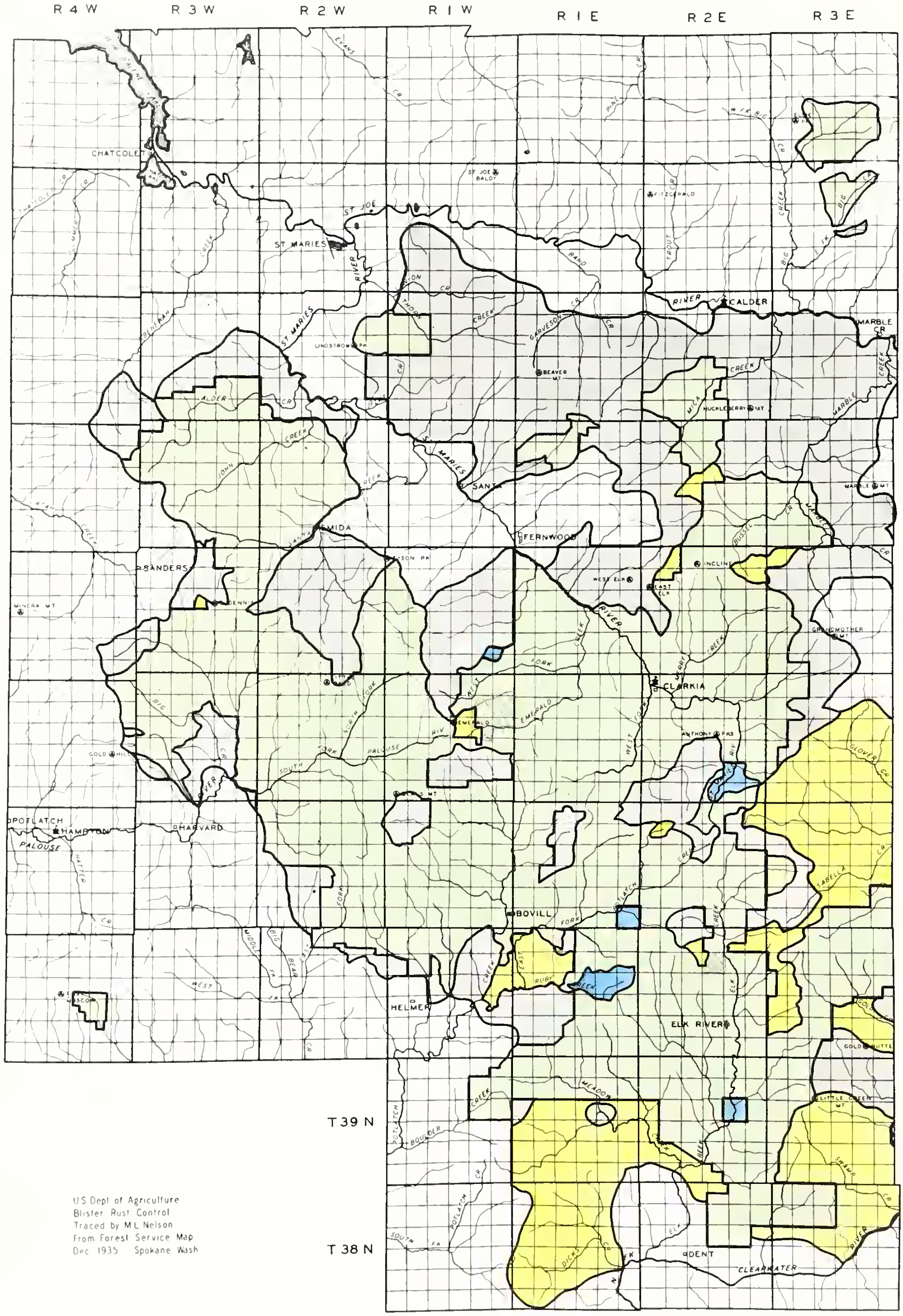
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1937
CLEARWATER OPERATION

Ownership Class	Number of Acres: Worked	Unworked	Total
Forest Service	144,590	49,523	194,113
Public Domain	3,680	1,227	4,907
Sub-total Federal	148,270	50,750	199,020
State	78,662	21,568	100,230
Private	162,240	58,807	221,047
Total	389,172	131,125	520,297

TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1929-1937
CLEARWATER OPERATION

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lecustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Open Reproduction	55,349	7,071,114	22,257,579	72,747	41,600	115,547		29,558,587
	Dense Reproduction	11,088	157,346	980,480	2,457	5,726	15,584		1,161,593
	Open Pole	25,441	2,340,591	1,221,117	31,301	6	7,090	462	3,600,567
	Dense Pole	3,534	127,043	57,703	316				185,062
	Open Mature	213,448	16,028,901	6,745,889	197,117	107,057	57,641	26	23,136,631
	Dense Mature	5,309	104,873	22,438	715	865	1,980		130,871
	Cut Over	27,726	2,100,601	8,431,923	38,603	27,752	11,210		10,610,089
	Brush	2,795	210,516	490,931	17,270	114	10,416		729,247
	Burn	1,045	74,796	838,377	568		3,868		917,609
	Subalpine	122	53,500	448					53,948
	Meadow-Field	1,890							
	All Upland	347,747	28,269,281	41,046,885	361,094	183,120	223,336	488	70,064,204
	Stream	41,425	9,763,545	323,966	2,659,902	689,985	25,394		13,462,792
	All Types	389,172	38,032,826	41,370,851	3,020,996	873,105	248,730	488	83,546,996
Second	Open Reproduction	4,672	85,905	267,313	5,471				358,689
	Dense Reproduction	411	68	1,142	4				1,214
	Open Pole	2,315	18,699	42,035	3,691				64,425
	Open Mature	10,091	160,199	207,668	13,343	116			381,326
	Dense Mature	272	244	159					403
	Cut Over	7,394	184,925	992,122	18,256				1,195,303
	Brush	79	424	2,962					3,386
	All Upland	25,234	450,464	1,513,401	40,765	116			2,004,746
	Stream	13,666	939,000	112,495	544,856	69,557			1,665,908
	All Types	38,900	1,389,464	1,625,896	585,621	69,673			3,670,654
Third	Stream	1,765	137,955	1,151	35,820	6,778			181,704
All Workings	Open Reproduction	60,021	7,157,019	22,524,892	78,218	41,600	115,547		29,917,276
	Dense Reproduction	11,499	157,414	981,622	2,461	5,726	15,584		1,162,807
	Open Pole	27,756	2,359,290	1,263,152	34,992	6	7,090	462	3,664,992
	Dense Pole	3,534	127,043	57,703	316				185,062
	Open Mature	223,539	16,189,100	6,953,557	210,460	107,173	57,641	26	23,517,957
	Dense Mature	5,581	105,117	22,597	715	865	1,980		131,274
	Cut Over	35,120	2,285,526	9,424,045	56,859	27,752	11,210		11,805,392
	Brush	2,874	210,940	493,893	17,270	114	10,416		732,633
	Burn	1,045	74,796	838,377	568		3,868		917,609
	Subalpine	122	53,500	448					53,948
	Meadow-Field	1,890							
	All Upland	372,981	28,719,745	42,560,286	401,859	183,236	223,336	488	72,088,950
	Stream	56,856	10,840,500	437,612	3,240,578	766,320	25,394		15,310,404
	All Types	429,837	39,560,245	42,997,898	3,642,437	949,556	248,730	488	87,399,354



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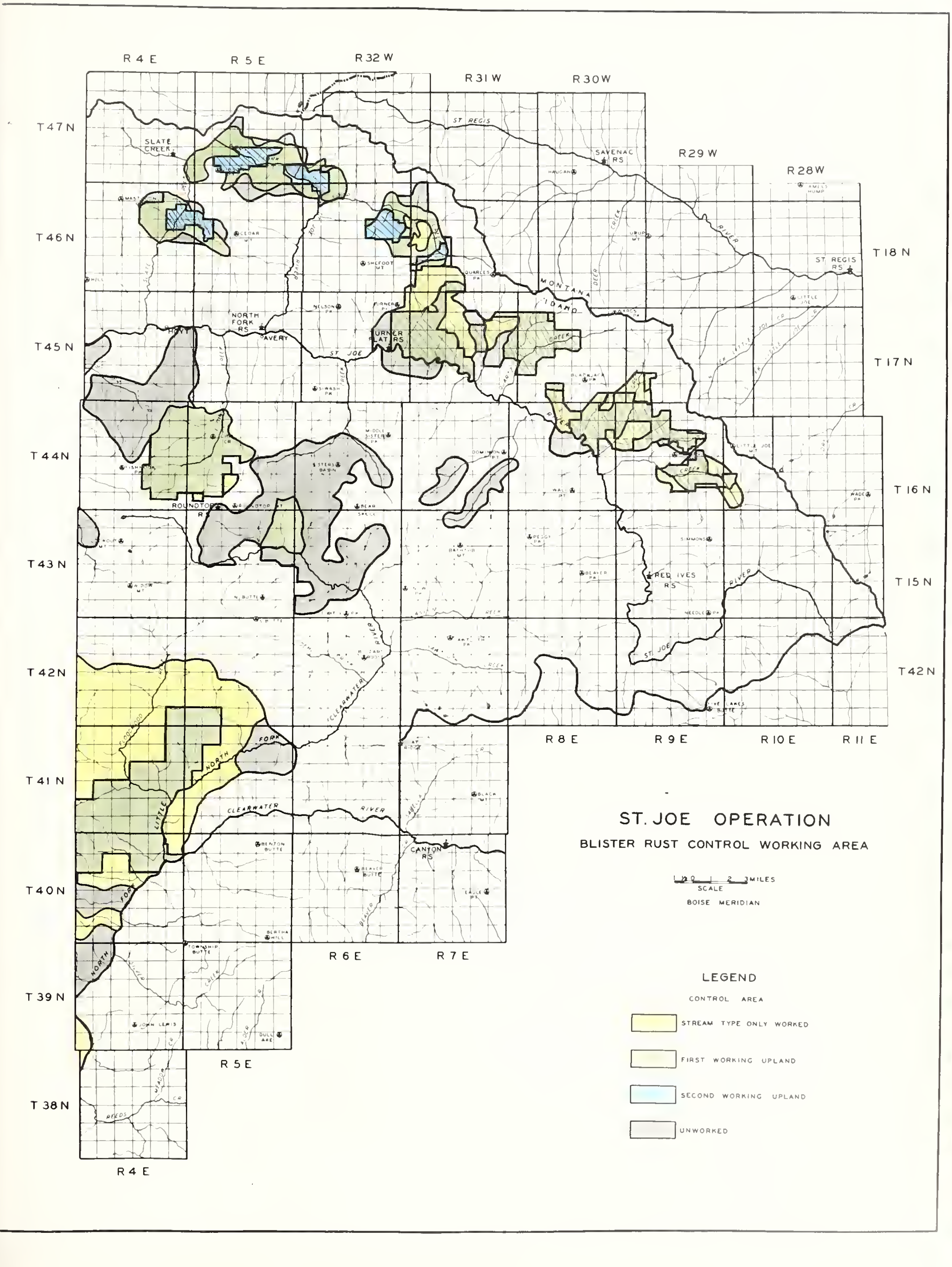

ST. JOE OPERATION
BLISTER RUST CONTROL WORKING AREA
SCALE
3 MILES
BOISE MERIDIAN
LEGEND
CONTROL AREA
STREAM TYPE ONLY WORKED
FIRST WORKING UPLAND
SECOND WORKING UPLAND
UNWORKED
R 4 E
R 5 E
R 32 W
R 31 W
R 30 W
R 29 W
R 28 W
R 6 E
R 7 E
R 8 E
R 9 E
R 10 E
R 11 E
T 47 N
T 46 N
T 45 N
T 44 N
T 43 N
T 42 N
T 41 N
T 40 N
T 39 N
T 38 N
T 18 N
T 17 N
T 16 N
T 15 N
MONTANA
IDAHO
SLATE CREEK
SAVENAC RS
ST REGIS RS
NORTH FORK RS
AVERY
TURNER FLAT RS
ROUNDTOP RS
RED IVES RS
CANYON RS
ST REGIS
RIVER
ST JOE
CLEARWATER RIVER
LITTLE NORTH FORK

W 2309-1. Excellent stond of western white pine reproduction heovily infected by white pine blister rust. The presence of the rust is evident by the numerous deod branches or flags which hove o white oppeoronce in this photogroph. Neorly every pine oppeoring in the picture is infected. The rust wos introduced into this oreo in 1927.

W 2099. Closeup of western white pine heovily infected by blister rust. Note numerous bronch conkers. This infected pine is typicol of mony of the trees oppeoring in the picture obove.

[illegible]

[illegible]

[illegible]

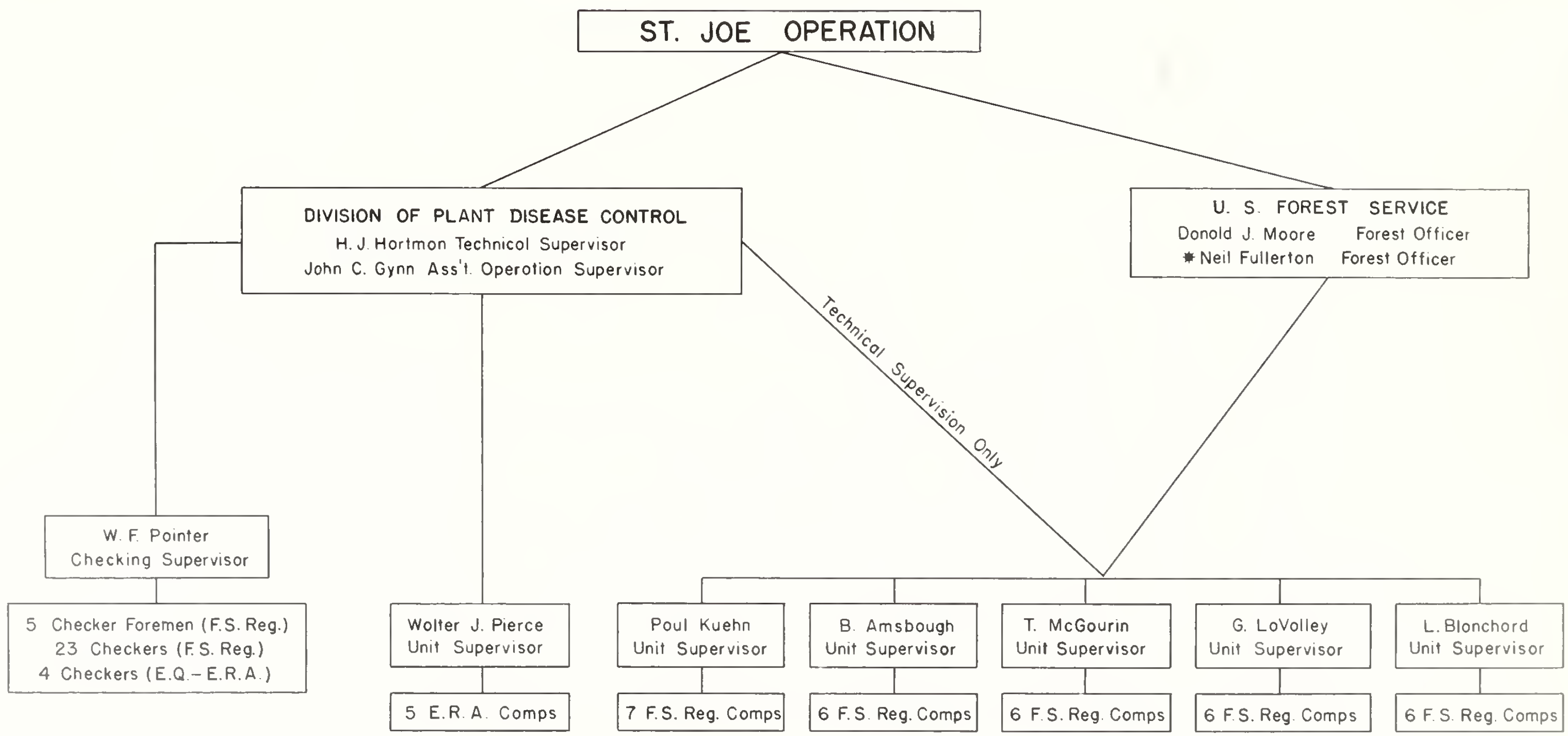
[illegible]

[illegible]

[illegible]

[illegible]

ORGANIZATION CHART



E. R. A.
Number of Comps
5 - 90 - Mon Comps
Number of Men 360

Forest Service Regular
Number of Comps
31 - 33 - Man Comps
Number of Men 930

Totol Number of Men on Blister Rust Work - 1290
* Port Time Assistonce

[illegible] [illegible] reproduction areas [illegible] were covered by [illegible] western white pine following logging between 1910 and [illegible] camp worked 8,140 acres for the season.

METHODS AND EQUIPMENT

The standard methods of [illegible] eradication [illegible] and 1938 annual report were followed in all camps. [illegible] almost exclusively on hand eradication although the [illegible] two-man crews. [illegible] treatment of R. [illegible] eradication was carried on extensively in the reproduction [illegible] Creek, Loop Creek and the North Fork of [illegible]

Over 250 knapsack spray units were employed [illegible] Service camps in spraying R. petiolare [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] chemical methods [illegible] found to be [illegible] [illegible] [illegible] it is recommended [illegible] second eradication be performed on these [illegible] three years at least.

Two training schools of two days each were held [illegible] May for unit supervisors and camp bosses of Forest Service [illegible] instructions and training were continued throughout the season.

The laborers employed in the Forest Service [illegible] through the National Reemployment Service in the [illegible] In addition 300 forestry students from twelve universities [illegible] employed through special requisition. [illegible] evidence that college students do better in [illegible] other classes. It is noted also that a [illegible] students was recommended for supervisory and [illegible] of the other classes. From observations it is [illegible] employment of forestry students in [illegible]

W 913 and W 913-6. Two pictures of the same area showing natural regeneration and growth of western white pine Snagging has taken place through natural agencies. The upper picture was taken in 1931; the lower in 1937. This area was logged in 1914 or 1915 and was burned about 1917. Area in foreground is grazed annually by sheep.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

SUMMARY OF RIBES ERADICATION, 1937
ST. JOE OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre	
								Bushes	Live Stem
Open Reproduction	6,385	6,714		13,099	23,322	6,452,219		4.2	11.8
Dense Reproduction	297	38		335	132	18,009		2.0	7.4
Open Pole	5,030	339		5,369	3,069	722,325		2.1	7.5
Dense Pole	228			228				.3	1.4
Open Mature	19,319	841		20,160	11,198	2,608,823		2.9	8.6
Dense Mature		86		86	6	301		1.8	2.7
Brush		332		332	7	745		.4	1.4
All Upland	31,259	8,350		39,609	37,734	9,802,422		3.2	9.4
Stream (Hand)	1,427	1,088	134	2,649	10,211	3,999,677		4.3	9.0
Stream (Chemical)	1,182	910		2,092	5,989	569,433	189,811		
Stream (Slash)		3		3	39	1,500			
All Stream	1,427	1,091	134	2,652	16,239	4,570,610		4.3	9.0
All Types	32,686	9,441	134	42,261	53,973	14,373,032		3.4	9.3

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
					Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Open Reproduction	6,385	18,490	5,465,911		2.90	856		7.2	20.1
Dense Reproduction	297	118	16,309		.40	55		2.1	7.6
Open Pole	5,030	2,927	710,099		.58	141		2.1	7.7
Dense Pole	228							.3	1.4
Open Mature	19,319	10,615	2,551,834		.55	132		2.8	8.4
All Upland	31,259	32,150	8,744,153		1.03	280		3.6	10.7
Stream (Hand)	1,427	7,529	3,369,943		5.28	2,362			
Stream (Chemical)	1,182	4,686	499,905	166,635	3.96	423	141		
All Stream	1,427	12,215	3,869,848		8.56	2,712		5.3	11.3
All Types	32,686	44,365	12,614,001		1.36	386		3.9	10.8

TABLE NO. 3B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Open Reproduction	6,714	4,832	986,308		.72	147		1.3	3.8
Dense Reproduction	38	14	1,700		.37	45		2.0	5.3
Open Pole	339	142	12,226		.42	36		1.3	3.9
Open Mature	841	583	56,989		.69	68		4.7	11.5
Dense Mature	86	6	301		.07	4		1.8	2.7
Brush	332	7	745		.02	2		.4	1.4
All Upland	8,350	5,584	1,058,269		.67	127		1.6	4.5
Stream (Hand)	1,088	2,412	596,349		2.22	548			
Stream (Chemical)	910	1,303	69,528	23,176	1.43	76	25		
Stream (Slash)	3	39	1,500		13.00	500			
All Stream	1,091	3,754	667,377		3.44	612		2.1	4.9
All Types	9,441	9,338	1,725,646		.99	183		1.8	4.6

TABLE NO. 3C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Stream (Hand)	134	270	33,385		2.01	249		7.6	9.8
All Stream	134	270	33,385		2.01	249		7.6	9.8

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1937
ST. JOE OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Ribes	Gallons Per Sprayed Area
First	EQ-ERA	8,738	14,663	4,234,431		1.68	485	
	FS-Reg.	23,948	29,702	8,379,570	166,635	1.24	350	141
	Total	32,686	44,365	12,614,001	166,635	1.36	386	141
Second	EQ-ERA	1,860	1,183	139,936		.64	75	
	FS-Reg	7,581	8,155	1,585,710	23,176	1.08	209	25
	Total	9,441	9,338	1,725,646	23,176	.99	183	25
Third	EQ-ERA	134	270	33,385		2.01	249	
All Workings	EQ-ERA	10,732	16,116	4,407,752		1.50	411	
	FS-Reg	31,529	37,857	9,965,280	189,811	1.20	316	91
	Total	42,261	53,973	14,373,032	189,811	1.28	340	91

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1937
ST. JOE OPERATION

		Number of Acres Worked												
		By Forest Service		By Bureau of Entomology and Plant Quarantine					Total					
				Federal					Federal					
State	Working	Forest Service	Private	Forest Service	Public Domain	Total	State	Private	Forest Service	Public Domain	Total	State	Private	Total
Idaho	First	23,665	283	3,620	120	3,740	3,216	1,782	27,285	120	27,405	3,216	2,065	32,686
	Second	6,505	1,076	162	360	522	150	1,188	6,667	360	7,027	150	2,264	9,441
	Third			12	12	24	44	66	12	12	24	44	66	134
	Total	30,170	1,359	3,794	492	4,286	3,410	3,036	33,964	492	34,456	3,410	4,395	42,261

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1937
ST. JOE OPERATION

	Average Results for All Areas															Areas with More Than 25 Feet Live Stem Per Acre		
			Ribes per Acre															
			Ribes lacustre		Ribes viscosissimum		Ribes petiolare		Ribes inerme		Ribes irriguum		All Species			Per Acre	
Eradication Type	Acres in Checked Area	Acres Checked	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Acres	Bushes	Live Stem
Open Reproduction	13,099	531	.9	2.8	3.3	9.0					.01	.06	4.2	11.8	1,864	13.6	41.4
Dense Reproduction	335	13	.6	2.5	1.4	4.9							2.0	7.4			
Open Pole	5,369	216	1.1	4.6	.9	2.5					.1	.4	2.1	7.5	87	13.2	56.9
Dense Pole	228	10	.2	.5	.1	.9							.3	1.4			
Open Mature	20,160	812	1.7	5.3	1.2	3.1					.1	.2	3.0	8.6	527	12.4	41.3
Dense Mature	86	3			1.8	2.7							1.8	2.7			
Brush	332	13	.2	.3	.2	1.1							.4	1.4			
All Upland	39,609	1,598	1.4	4.3	1.8	4.9					.04	.2	3.2	9.4	2,478	13.4	41.9
Stream	2,652	510	3.3	6.3			.7	2.4	.3	.3			4.3	9.0	31	41.9	65.8
All Types	42,261	2,108	1.7	4.8	1.4	3.7	.2	.6	.1	.1	.03	.1	3.4	9.3	2,509	15.8	45.5

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1937
ST. JOE OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	
First	Open Reproduction	6,385	1,009,811	4,396,684	491	334	58,591	5,465,911
	Dense Reproduction	297	4,110	10,812			1,387	16,309
	Open Pole	5,030	331,953	316,917		607	60,622	710,099
	Dense Pole	228						
	Open Mature	19,319	1,926,983	523,318	7,186	9,254	85,093	2,551,834
	All Upland	31,259	3,272,857	5,247,731	7,677	10,195	205,693	8,744,153
	Stream	1,427	2,833,967	28,149	500,778	500,598	6,356	3,869,848
	All Types	32,686	6,106,824	5,275,880	508,455	510,793	212,049	12,614,001
Second	Open Reproduction	6,714	412,322	573,520	330	18	118	986,308
	Dense Reproduction	38	42	1,658				1,700
	Open Pole	339	1,360	10,866				12,226
	Open Mature	841	8,002	48,987				56,989
	Dense Mature	86	195	106				301
	Brush	332		745				745
	All Upland	8,350	421,921	635,882	330	18	118	1,058,269
	Stream	1,091	486,974	21,330	101,728	57,325	20	667,377
	All Types	9,441	908,895	657,212	102,058	57,343	138	1,725,646
Third	Stream	134	20,242	2,480	10,663			33,385
All Workings	Open Reproduction	13,099	1,422,133	4,970,204	821	352	58,709	6,452,219
	Dense Reproduction	335	4,152	12,470			1,387	18,009
	Open Pole	5,369	333,313	327,783		607	60,622	722,325
	Dense Pole	228						
	Open Mature	20,160	1,934,985	572,305	7,186	9,254	85,093	2,608,823
	Dense Mature	86	195	106				301
	Brush	332		745				745
	All Upland	39,609	3,694,778	5,883,613	8,007	10,213	205,811	9,802,422
	Stream	2,652	3,341,183	51,959	613,169	557,923	6,376	4,570,610
	All Types	42,261	7,035,961	5,935,572	621,176	568,136	212,187	14,373,032

SUMMARY OF RIBES ERADICATION, 1929-1937
ST. JOE OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray
Open Reproduction	152,474	7,341		159,815	193,075	70,322,822	
Dense Reproduction	41,647	481		42,128	10,663	1,639,008	
Open Pole	54,464	339		54,803	22,371	5,248,650	
Dense Pole	22,366			22,366	4,543	910,833	
Open Mature	177,055	2,712		179,767	71,171	20,279,345	
Dense Mature	9,745	86		9,831	1,565	255,735	
Cut Over	1,009	70		1,079	655	100,364	
Brush	2,452	332		2,784	1,888	677,365	
Burn	2,224			2,224	1,061	795,464	
Subalpine	200			200	416	90,809	
All Upland	463,636	11,361		474,997	307,408	100,320,395	
Stream (Hand)	33,574	7,961	1,511	43,046	74,884	22,349,425	
Stream (Chemical)	6,782	2,404	98	9,284	23,416	2,056,410	685,470
Stream (Slash)	791	27		818	10,420	409,100	
All Stream	34,365	7,988	1,511	43,864	108,720	24,814,935	
All Types	498,001	19,349	1,511	518,861	416,128	125,135,330	

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis		
					Man Days	Ribes	Gallons Spray
Open Reproduction	152,474	187,855	69,261,906		1.23	454	
Dense Reproduction	41,647	10,519	1,616,154		.25	39	
Open Pole	54,464	22,229	5,236,424		.41	96	
Dense Pole	22,366	4,543	910,833		.20	41	
Open Mature	177,055	70,127	20,128,037		.40	114	
Dense Mature	9,745	1,559	255,434		.16	26	
Cut Over	1,009	654	100,332		.65	99	
Brush	2,452	1,881	676,620		.77	276	
Burn	2,224	1,061	795,464		.48	358	
Subalpine	200	416	90,809		2.08	454	
All Upland	463,636	300,844	99,072,013		.65	214	
Stream (Hand)	33,574	59,812	19,294,321		1.78	575	
Stream (Chemical)	6,782	19,497	1,785,138	595,046	2.87	263	88
Stream (Slash)	791	10,101	395,600		12.77	500	
All Stream	34,365	89,410	21,475,059		2.60	625	
All Types	498,001	390,254	120,547,072		.78	242	

TABLE NO. 8B - SECOND WORKING

Open Reproduction	7,341	5,220	1,060,916		.71	145	
Dense Reproduction	481	144	22,854		.30	48	
Open Pole	339	142	12,226		.42	36	
Open Mature	2,712	1,044	151,308		.38	56	
Dense Mature	86	6	301		.07	4	
Cut Over	70	1	32		.01	1	
Brush	332	7	745		.02	2	
All Upland	11,361	6,564	1,248,382		.58	110	
Stream (Hand)	7,961	12,515	2,644,075		1.57	332	
Stream (Chemical)	2,404	3,764	257,781	85,927	1.57	107	36
Stream (Slash)	27	319	13,500		11.81	500	
All Stream	7,988	16,598	2,915,356		2.08	365	
All Types	19,349	23,162	4,163,738		1.20	215	

TABLE NO. 8C - THIRD WORKING

Stream (Hand)	1,511	2,557	411,029		1.69	272	
Stream (Chemical)	98	155	13,491	4,497	1.58	138	46
All Stream	1,511	2,712	424,520		1.79	281	

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1937
ST. JOE OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Per Acre Basis: Ribes	Per Acre Basis: Gallons Per Sprayed Area
First	FS-Reg.	63,902	60,844	19,763,416	203,763	.95	309	86
	EQ-NIRA	42,366	25,571	7,734,978	10,839	.60	183	68
	FS-NIRA	70,714	44,246	14,845,626	101,476	.63	210	129
	EQ-ERA	140,718	82,877	26,020,293	43,094	.59	185	113
	FS-ERA	267	892	487,480		3.34	1,826	
	Cooperative	17,073	13,484	3,864,001	56,611	.79	226	41
	F-ECW	94,606	111,903	36,004,895	156,673	1.18	381	123
	S&P-ECW	68,355	50,437	11,826,383	22,590	.74	173	53
	Total	498,001	390,254	120,547,072	595,046	.78	242	88
Second	FS-Reg.	7,760	8,307	1,605,160	23,805	1.07	207	25
	EQ-NIRA	1,742	1,228	291,131		.70	167	
	EQ-ERA	3,363	2,306	337,693	2,377	.69	100	16
	Cooperative	489	291	48,475	2,674	.60	99	11
	F-ECW	3,747	6,673	1,425,680	28,119	1.78	380	54
	S&P-ECW	2,248	4,357	455,599	28,952	1.94	203	54
	Total	19,349	23,162	4,163,738	85,927	1.20	215	36
Third	EQ-ERA	134	270	33,385		2.01	249	
	F-ECW	1,308	2,380	388,277	4,497	1.82	297	46
	S&P-ECW	69	62	2,858		.90	41	
	Total	1,511	2,712	424,520	4,497	1.79	281	46
All Workings	FS-Reg.	71,662	69,151	21,368,576	227,568	.96	298	69
	EQ-NIRA	44,108	26,799	8,026,109	10,839	.61	182	68
	FS-NIRA	70,714	44,246	14,845,626	101,476	.63	210	129
	EQ-ERA	144,215	85,453	26,391,371	45,471	.59	183	86
	FS-ERA	267	892	487,480		3.34	1,826	
	Cooperative	17,562	13,775	3,912,476	59,285	.78	223	36
	F-ECW	99,661	120,956	37,818,852	189,289	1.21	379	100
	S&P-ECW	70,672	54,856	12,284,840	51,542	.78	174	53
	Total	518,861	416,128	125,135,330	685,470	.80	241	74

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1937
ST. JOE OPERATION

Working	Number of Acres Worked by Ownership Classes: Federal: Forest Service	Federal: Public Domain	Federal: Total	State - Idaho	Private	Total
First	192,033	12,005	204,038	65,335	228,628	498,001
Second	9,398	400	9,798	1,830	7,721	19,349
Third	833	52	885	115	511	1,511
All Workings	202,264	12,457	214,721	67,280	236,860	518,861

TABLE NO. 11

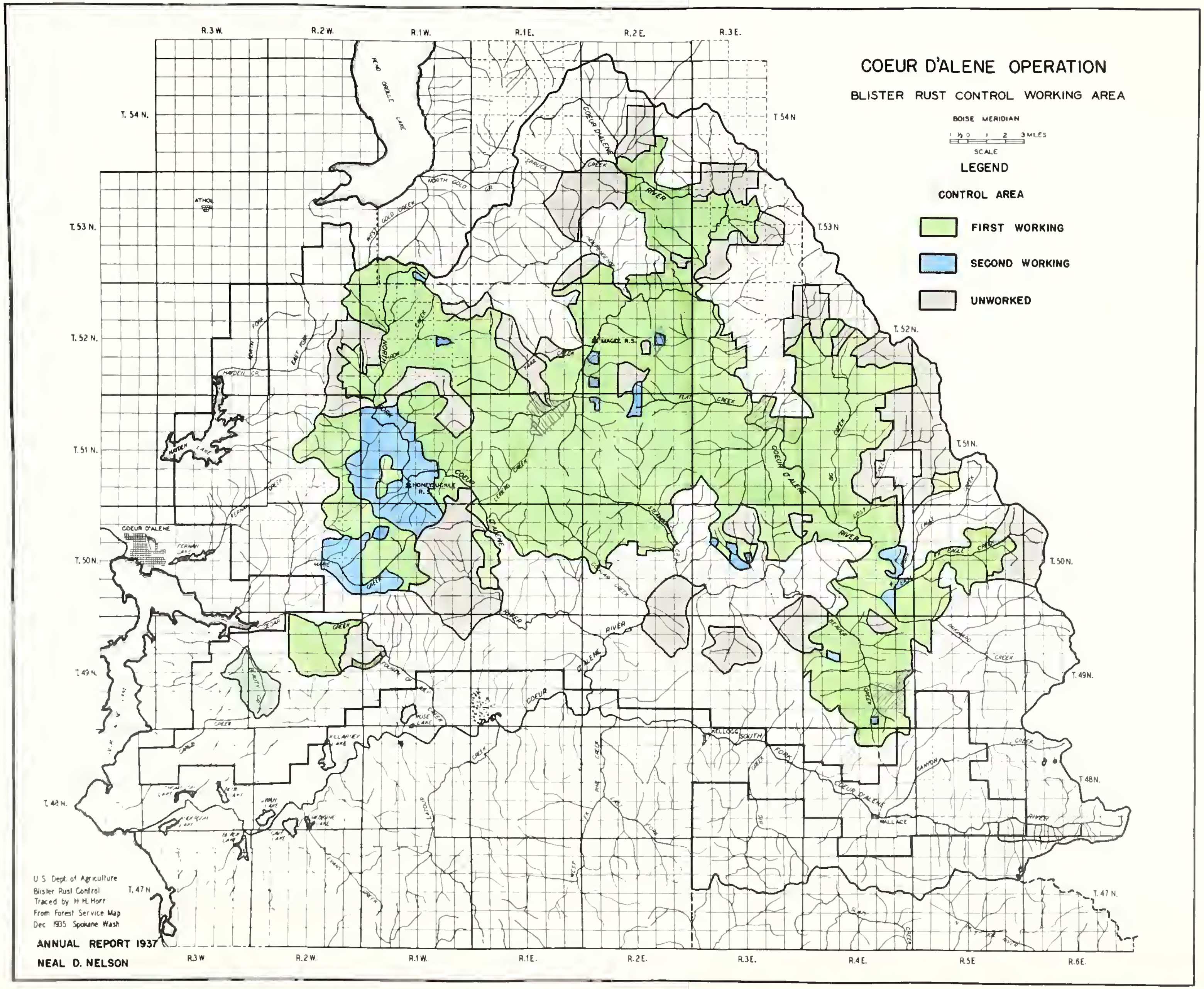
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1937
ST. JOE OPERATION

Ownership Classes	Number of Acres: Worked	Unworked	Total
Forest Service	192,033	177,355	369,388
Public Domain	12,005	18,795	30,800
Sub-total Federal	204,038	196,150	400,188
State	65,335	61,232	126,567
Private	228,628	229,702	458,330
Total	498,001	487,084	985,085

TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED 1929-1937
ST. JOE OPERATION

Working	Eradication Type	Acres	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Total Ribes
First	Open Reproduction	152,474	11,591,920	57,141,681	93,709	304,455	130,141	69,261,906
	Dense Reproduction	41,647	797,969	762,075	13,310	27,287	15,513	1,616,154
	Open Pole	54,464	1,863,811	3,217,935	19,610	61,506	73,562	5,236,424
	Dense Pole	22,366	450,035	457,269	1,335	1,993	201	910,833
	Open Mature	177,055	9,960,774	9,979,778	26,511	42,519	118,455	20,128,037
	Dense Mature	9,745	160,499	94,546	389			255,434
	Cut Over	1,009	64,897	30,125	5,269	41		100,332
	Brush	2,452	93,470	579,731	1,987	1,432		676,620
	Burn	2,224	133,557	652,633	8,327	947		795,464
	Subalpine	200	54,975	35,834				90,809
	All Upland	463,636	25,171,907	72,951,607	170,447	440,180	337,872	99,072,013
	Stream	34,365	14,814,785	839,104	3,087,358	2,717,445	16,367	21,475,059
	All Types	498,001	39,986,692	73,790,711	3,257,805	3,157,625	354,239	120,547,072
Second	Open Reproduction	7,341	428,813	628,878	330	18	2,877	1,060,916
	Dense Reproduction	481	10,340	12,514				22,854
	Open Pole	339	1,360	10,866				12,226
	Open Mature	2,712	63,584	82,258	31		5,435	151,308
	Dense Mature	86	195	106				301
	Cut Over	70	12			20		32
	Brush	332		745				745
	All Upland	11,361	504,304	735,367	361	38	8,312	1,248,382
	Stream	7,988	1,728,494	87,161	648,413	445,329	5,959	2,915,356
	All Types	19,349	2,232,798	822,528	648,774	445,367	14,271	4,163,738
Third	Stream	1,511	202,603	13,002	120,268	88,647		424,520
All Workings	Open Reproduction	159,815	12,020,733	57,770,559	94,039	304,473	133,018	70,322,822
	Dense Reproduction	42,128	808,309	774,589	13,310	27,287	15,513	1,639,008
	Open Pole	54,803	1,865,171	3,228,801	19,610	61,506	73,562	5,248,650
	Dense Pole	22,366	450,035	457,269	1,335	1,993	201	910,833
	Open Mature	179,767	10,024,358	10,062,036	26,542	42,519	123,890	20,279,345
	Dense Mature	9,831	160,694	94,652	389			255,735
	Cut Over	1,079	64,909	30,125	5,269	61		100,364
	Brush	2,784	93,470	580,476	1,987	1,432		677,365
	Burn	2,224	133,557	652,633	8,327	947		795,464
	Subalpine	200	54,975	35,834				90,809
	All Upland	474,997	25,676,211	73,686,974	170,808	440,218	346,184	100,320,395
	Stream	43,864	16,745,882	939,267	3,856,039	3,251,421	22,326	24,814,935
	All Types	518,861	42,422,093	74,626,241	4,026,847	3,691,639	368,510	125,135,330


COEUR D'ALENE OPERATION
BLISTER RUST CONTROL WORKING AREA
BOISE MERIDIAN
SCALE
3 MILES
LEGEND
CONTROL AREA
FIRST WORKING
SECOND WORKING
UNWORKED
R.3 W.
R.2 W.
R.1 W.
R.1 E.
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T. 48 N.
T. 47 N.
PEND OREILLE LAKE
ATHOL
HAYDEN LAKE
COEUR D'ALENE
MAGEE R.S.
HONEYSUCKLE R.S.
KELLOGG
WALLACE
ROSE LAKE
U.S. Dept. of Agriculture
Blister Rust Control
Traced by H. H. Horr
From Forest Service Map
Dec 1935 Spokane Wash
ANNUAL REPORT 1937
NEAL D. NELSON

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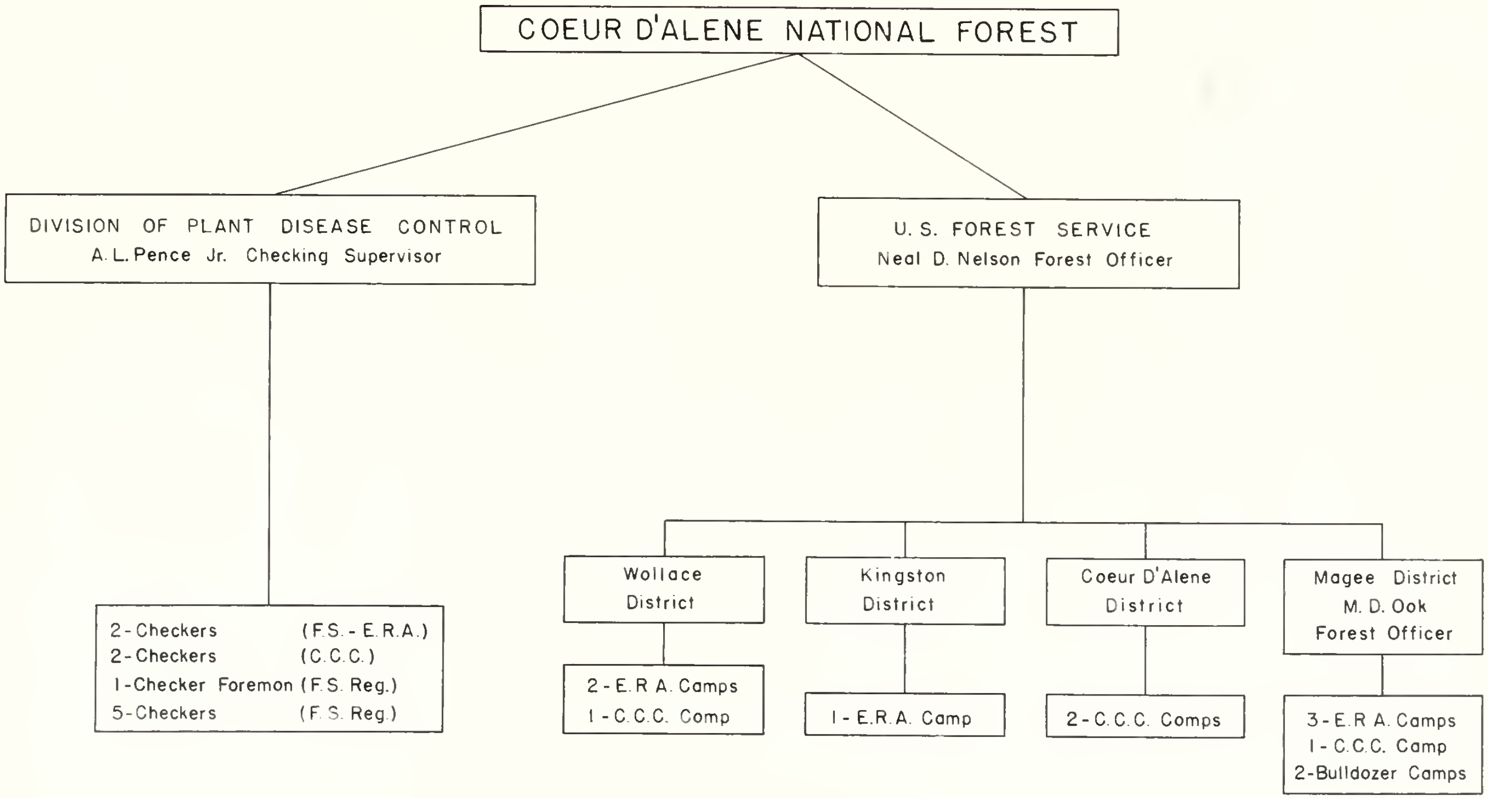
†ORGANIZATION CHART



F.S. - E.R.A.
1 - 60 - Man Camp
5 - 30 - Man Camps
Number of Camps - 6
Number of Men - 210

FOREST SERVICE REG.
2 - Bulldozer Camps
10 - Men Each

C.C.C.
Number of Camps - 4
Number of Men - 80

Total Number of Men on Blister Rust Work - 310
†Technicol Supervision Only

SUMMARY OF RIBES ERADICATION 1937
COEUR D'ALENE NATIONAL FOREST

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Total Acres	Total Effective Man Days	Total Ribes	Ribes Remaining Per Acre	
						Bushes	Live Stem
Open Reproduction	1,057	126	1,183	3,812	670,688	16.3	70.1
Dense Reproduction	27		27	35	4,333	2.0	17.0
Open Pole	3,352	276	3,628	1,800	350,013	1.6	3.0
Open Mature	1,923		1,923	953	94,821	2.4	14.8
Dense Mature	214		214	73	18,607	0.9	2.4
Cut Over	164	351	515	1,383	144,230	6.8	5.1
Brush		70	70	149	13,633	8.3	22.0
All Upland	6,737	823	7,560	8,205	1,296,325	4.5	17.3
Stream (Hand)	139	399	538	1,194	261,668	4.6	10.1
Stream (Machine)	264		264	1,434	132,000		
All Stream	403	399	802	2,628	393,668	4.6	10.1
All Types	7,140	1,222	8,362	10,833	1,689,993	4.5	15.7

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man Days	Ribes	Bushes	Live Stem
Open Reproduction	1,057	3,564	647,967	3.37	613	18.7	80.6
Dense Reproduction	27	35	4,333	1.30	160	2.0	17.0
Open Pole	3,352	1,588	283,569	.47	85	1.6	3.1
Open Mature	1,923	953	94,821	.50	49	2.5	14.7
Dense Mature	214	73	18,607	.34	87	0.9	2.4
Cut Over	164	493	54,624	3.01	333	7.9	2.8
All Upland	6,737	6,706	1,103,921	1.00	164	4.5	17.9
Stream (Hand)	139	321	43,833	2.31	315	3.5	7.7
Stream (Machine)	264	1,434	132,000	5.43	500		
All Stream	403	1,755	175,833	4.35	436	3.5	7.7
All Types	7,140	8,461	1,279,754	1.19	179	4.4	16.5

TABLE NO. 3B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Man Days	Ribes	Bushes	Live Stem
Open Reproduction	126	248	22,721	1.97	180	10.4	45.0
Open Pole	276	212	66,444	.77	241	0.9	2.3
Cut Over	351	890	89,606	2.54	255	6.1	6.6
Brush	70	149	13,633	2.13	195	8.3	22.0
All Upland	823	1,499	192,404	1.82	234	5.2	12.9
Stream (Hand)	399	873	217,835	2.19	546	5.8	12.4
All Types	1,222	2,372	410,239	1.94	336	5.5	12.6

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1937.
COEUR D'ALENE NATIONAL FOREST

Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis	
					Man Days	Ribes
First	FS-ERA	4,947	4,417	840,293	.89	170
	FS-Bulldozer	264	1,434	132,000	5.43	500
	F-ECW	1,929	2,610	307,461	1.35	159
	Total	7,140	8,461	1,279,754	1.19	179
Second	FS-ERA	871	1,482	320,633	1.70	368
	F-ECW	351	890	89,606	2.54	255
	Total	1,222	2,372	410,239	1.94	336
All Workings	FS-ERA	5,818	5,899	1,160,926	1.01	200
	FS-Bulldozer	264	1,434	132,000	5.43	500
	F-ECW	2,280	3,500	397,067	1.54	174
	Total	8,362	10,833	1,689,993	1.30	202

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1937
COEUR D'ALENE NATIONAL FOREST

State	Working	Number of Acres Worked by Forest Service		Total
		Forest Service	Private	
Idaho	First	6,760	380	7,140
	Second	871	351	1,222
	Total	7,631	731	8,362

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED DURING 1937
COEUR D'ALENE NATIONAL FOREST

Eradication Type	Average Results for All Areas								Areas with More Than 25 Feet Live Stem Per Acre		
	Acres in Checked Area	Acres Checked	Ribes per Acre						Acres	Per Acre	
			Ribes lacustre		Ribes viscosissimum		All Species				
			Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem		Bushes	Live Stem
Open Reproduction	1,183	48	3.7	15.0	12.6	55.1	16.3	70.1	893	21.8	95.8
Dense Reproduction	27	1	1.0	16.0	1.0	1.0	2.0	17.0			
Open Pole	3,628	145	1.3	2.3	0.3	0.7	1.6	3.0			
Open Mature	1,923	78	2.3	14.1	0.1	0.7	2.4	14.8	145	16.9	132.9
Dense Mature	214	10	0.9	2.4			0.9	2.4			
Cut Over	515	21	6.4	4.2	0.4	0.9	6.8	5.1			
Brush	70	3	0.3	1.7	8.0	20.3	8.3	22.0			
All Upland	7,560	306	2.3	7.9	2.2	9.4	4.5	17.3	1,038	21.1	101.0
Stream (Hand)	538	90	4.6	10.1			4.6	10.1	60	10.0	31.2
Stream (Machine)	264										
All Stream	802										
All Types	8,362	396	2.8	8.4	1.7	7.3	4.5	15.7	1,098	20.6	98.1

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1937
COEUR D'ALENE NATIONAL FOREST

Working	Eradication Type	Acres	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Total Ribes
First	Open Reproduction	1,057	228,550	419,417				647,967
	Dense Reproduction	27	1,801	2,532				4,333
	Open Pole	3,352	232,259	39,654	11,656			283,569
	Open Mature	1,923	87,528	1,546		3,470	2,277	94,821
	Dense Mature	214	18,592	15				18,607
	Cut Over	164	49,163	5,461				54,624
	All Upland	6,737	617,893	468,625	11,656	3,470	2,277	1,103,921
	Stream	403	66,471	3,762		105,600		175,833
	All Types	7,140	684,364	472,387	11,656	109,070	2,277	1,279,754
Second	Open Reproduction	126	4,698	18,023				22,721
	Open Pole	276	60,234	1,474	4,736			66,444
	Cut Over	351	71,342	18,264				89,606
	Brush	70	2,819	10,814				13,633
	All Upland	823	139,093	48,575	4,736			192,404
	Stream	399	197,680	1		20,154		217,835
	All Types	1,222	336,773	48,576	4,736	20,154		410,239
All Workings	Open Reproduction	1,183	233,248	437,440				670,688
	Dense Reproduction	27	1,801	2,532				4,333
	Open Pole	3,628	292,493	41,128	16,392			350,013
	Open Mature	1,923	87,528	1,546		3,470	2,277	94,821
	Dense Mature	214	18,592	15				18,607
	Cut Over	515	120,505	23,725				144,230
	Brush	70	2,819	10,814				13,633
	All Upland	7,560	756,986	517,200	16,392	3,470	2,277	1,296,325
	Stream	802	264,151	3,763		125,754		393,668
	All Types	8,362	1,021,137	520,963	16,392	129,224	2,277	1,689,993

SUMMARY OF RIBES ERADICATION, 1927-1937
COEUR D'ALENE NATIONAL FOREST

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Total Acres	Total Effective Man Days	Total Ribes
Open Reproduction	58,305	3,025	61,330	109,389	16,018,712
Dense Reproduction	10,436	652	11,088	10,489	1,049,529
Open Pole	41,281	3,654	44,935	22,147	3,622,346
Dense Pole	15,309	195	15,504	4,127	583,405
Open Mature	124,771	6,292	131,063	86,309	13,906,122
Dense Mature	13,023	542	13,565	2,065	259,023
Cut Over	9,594	2,002	11,596	14,866	3,843,760
Brush	10,029	504	10,533	13,811	1,968,763
Burn	5,343		5,343	3,188	720,379
Subalpine	485		485	283	76,762
All Upland	288,576	16,866	305,442	266,674	42,048,801
Stream (Hand)	12,209	1,978	14,187	50,541	10,975,628
Stream (Slash)	78	13	91	1,792	68,731
Stream (Machine)	1,045		1,045	4,616	522,500
All Stream	13,332	1,991	15,323	56,949	11,566,859
All Types	301,908	18,857	320,765	323,623	53,615,660

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Open Reproduction	58,305	103,430	15,434,635	1.77	265
Dense Reproduction	10,436	9,865	971,591	.95	93
Open Pole	41,281	19,919	3,166,689	.48	77
Dense Pole	15,309	4,059	577,629	.27	38
Open Mature	124,771	81,939	13,068,552	.66	105
Dense Mature	13,023	1,761	222,188	.14	17
Cut Over	9,594	12,099	3,427,047	1.26	357
Brush	10,029	13,078	1,871,117	1.30	187
Burn	5,343	3,188	720,379	.60	135
Subalpine	485	283	76,762	.58	158
All Upland	288,576	249,621	39,536,589	.87	137
Stream (Hand)	12,209	45,638	10,308,962	3.74	844
Stream (Slash)	78	1,340	64,934	17.18	832
Stream (Machine)	1,045	4,616	522,500	4.42	500
All Stream	13,332	51,594	10,896,396	3.87	817
All Types	301,908	301,215	50,432,985	1.00	167

TABLE NO. 8B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Open Reproduction	3,025	5,959	584,077	1.97	193
Dense Reproduction	652	624	77,938	.96	120
Open Pole	3,654	2,228	455,657	.61	125
Dense Pole	195	68	5,776	.35	30
Open Mature	6,292	4,370	837,570	.69	133
Dense Mature	542	304	36,835	.56	68
Cut Over	2,002	2,767	416,713	1.38	208
Brush	504	733	97,646	1.45	194
All Upland	16,866	17,053	2,512,212	1.01	149
Stream (Hand)	1,978	4,903	666,669	2.48	337
Stream (Slash)	13	452	3,794	34.77	292
All Stream	1,991	5,355	670,463	2.69	337
All Types	18,857	22,408	3,182,675	1.19	169

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1927-1937
COEUR D'ALENE NATIONAL FOREST

Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
First	EQ-Reg.	25,776	8,351	2,846,383	.32	110
	FS-Reg.	29,449	28,266	5,099,254	.96	173
	FS-NIRA	86,083	59,504	13,399,102	.69	156
	EQ-ERA	33,032	29,769	5,246,487	.90	159
	FS-ERA	8,113	9,482	1,768,651	1.17	218
	F-ECW	119,455	165,843	22,073,108	1.39	185
	Total	301,908	301,215	50,432,985	1.00	167
Second	FS-Reg.	5,891	4,826	1,256,701	.82	213
	FS-NIRA	5,300	2,869	498,629	.54	94
	EQ-ERA	42	44	5,151	1.05	123
	FS-ERA	871	1,482	320,633	1.70	368
	F-ECW	6,753	13,187	1,101,561	1.95	163
	Total	18,857	22,408	3,182,675	1.19	169
All Workings	EQ-Reg.	25,776	8,351	2,846,383	.32	110
	FS-Reg.	35,340	33,092	6,355,955	.94	180
	FS-NIRA	91,383	62,373	13,897,731	.68	152
	EQ-ERA	33,074	29,813	5,251,638	.90	159
	FS-ERA	8,984	10,964	2,089,284	1.22	233
	F-ECW	126,208	179,030	23,174,669	1.42	184
	Total	320,765	323,623	53,615,660	1.01	167

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1927-1937
COEUR D'ALENE NATIONAL FOREST

Working	Number of Acres Worked by Ownership Classes			Total
	Forest Service	State - Idaho	Private	
First	290,973	3,272	7,663	301,908
Second	17,201	60	1,596	18,857
All Workings	308,174	3,332	9,259	320,765

TABLE NO. 11

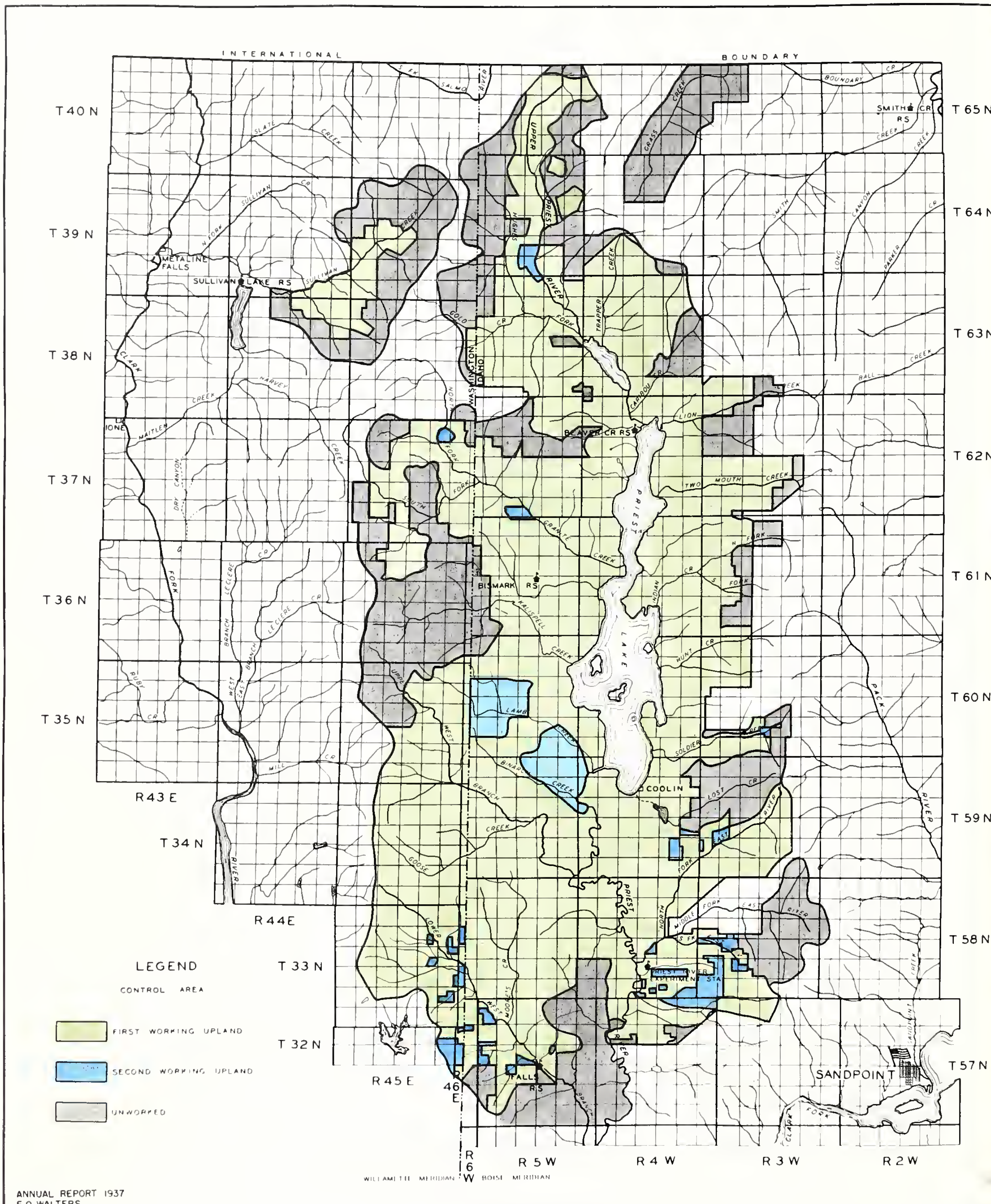
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1927-1937
COEUR D'ALENE NATIONAL FOREST

Ownership Classes	Number of Acres		
	Worked	Unworked	Total
Forest Service	290,973	12,891	303,864
State - Idaho	3,272	2,138	5,410
Private	7,663	7,386	15,049
Total	301,908	22,415	324,323

TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1927-1937
COEUR D'ALENE NATIONAL FOREST

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	
First	Open Reproduction	58,305	9,216,732	5,635,899		488,372	93,632	15,434,635
	Dense Reproduction	10,436	630,444	333,256		5,323	2,568	971,591
	Open Pole	41,281	1,900,042	1,215,340	11,656	6,453	33,198	3,166,689
	Dense Pole	15,309	434,291	138,309		3,741	1,288	577,629
	Open Mature	124,771	10,249,154	2,591,124	1	79,612	148,661	13,068,552
	Dense Mature	13,023	193,735	17,816		9,778	859	222,188
	Cut Over	9,594	2,548,234	833,851	1	17,456	27,505	3,427,047
	Brush	10,029	682,290	1,158,493		25,748	4,586	1,871,117
	Burn	5,343	311,507	389,918		13,530	5,424	720,379
	Subalpine	485	55,561	21,201				76,762
	All Upland	288,576	26,221,990	12,335,207	11,658	650,013	317,721	39,536,589
	All Stream	13,332	6,672,823	165,893	843	4,006,282	50,555	10,896,396
	All Types	301,908	32,894,813	12,501,100	12,501	4,656,295	368,276	50,432,985
Second	Open Reproduction	3,025	300,430	272,953		10,655	39	584,077
	Dense Reproduction	652	72,285	5,642		11		77,938
	Open Pole	3,654	366,534	80,505	4,736	3,882		455,657
	Dense Pole	195	5,509	267				5,776
	Open Mature	6,292	567,925	257,174		11,065	1,406	837,570
	Dense Mature	542	36,053	782				36,835
	Cut Over	2,002	324,475	81,787		10,451		416,713
	Brush	504	11,296	86,350				97,646
	All Upland	16,866	1,684,507	785,460	4,736	36,064	1,445	2,512,212
	All Stream	1,991	466,878	34,853		168,732		670,463
	All Types	18,857	2,151,385	820,313	4,736	204,796	1,445	3,182,675
All Workings	Open Reproduction	61,330	9,517,162	5,908,852		499,027	93,671	16,018,712
	Dense Reproduction	11,088	702,729	338,898		5,334	2,568	1,049,529
	Open Pole	44,935	2,266,576	1,295,845	16,392	10,335	33,198	3,622,346
	Dense Pole	15,504	439,800	138,576		3,741	1,288	583,405
	Open Mature	131,063	10,817,079	2,848,298	1	90,677	150,067	13,906,122
	Dense Mature	13,565	229,788	18,598		9,778	859	259,023
	Cut Over	11,596	2,872,709	915,638	1	27,907	27,505	3,843,760
	Brush	10,533	693,586	1,244,843		25,748	4,586	1,968,763
	Burn	5,343	311,507	389,918		13,530	5,424	720,379
	Subalpine	485	55,561	21,201				76,762
	All Upland	305,442	27,906,497	13,120,667	16,394	686,077	319,166	42,048,801
	All Stream	15,323	7,139,701	200,746	843	4,175,014	50,555	11,566,859
	All Types	320,765	35,046,198	13,321,413	17,237	4,861,091	369,721	53,615,660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WILLAMETTE MERIDIAN
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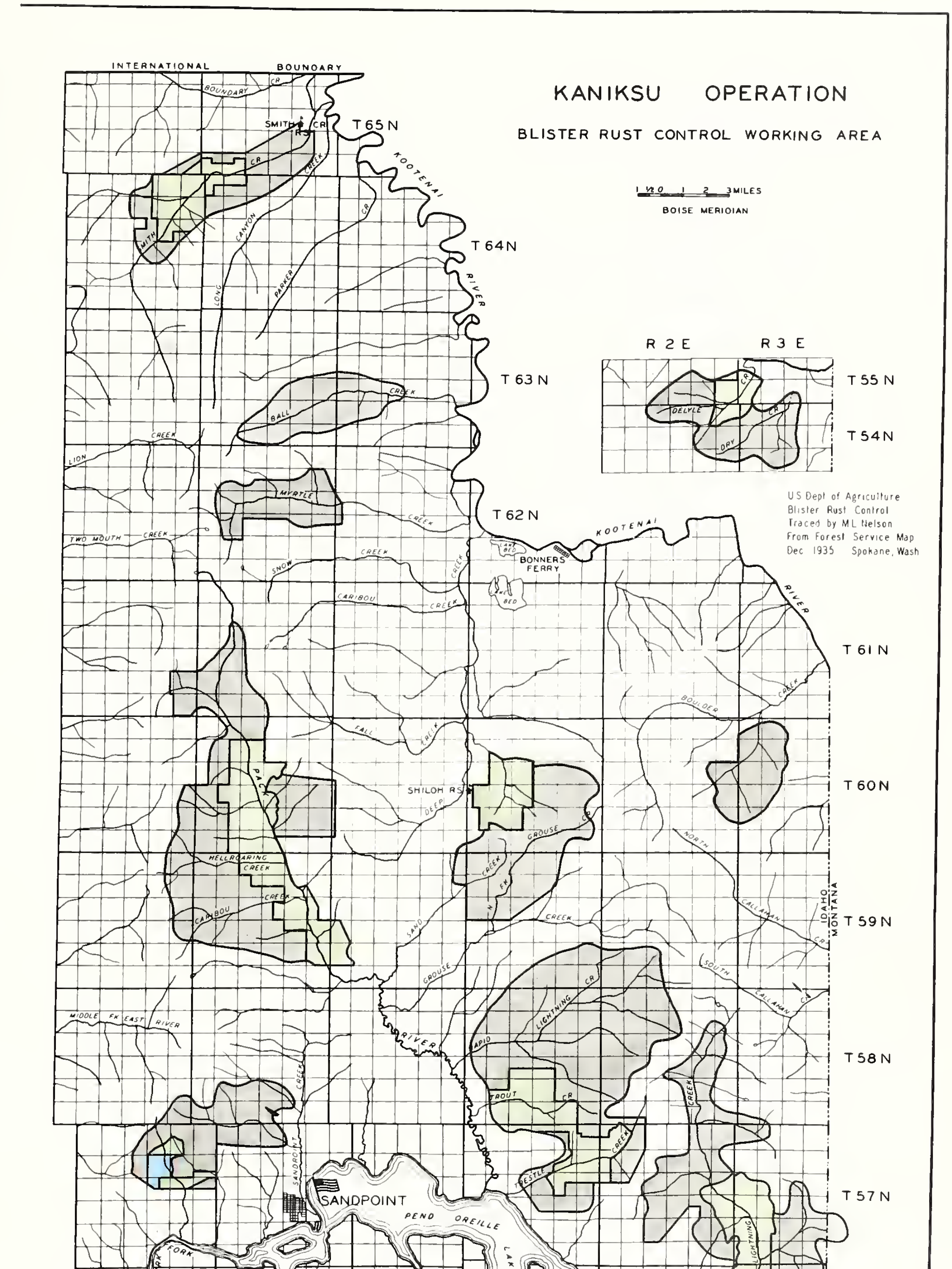
KANIKSU OPERATION
BLISTER RUST CONTROL WORKING AREA
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BOISE MERIDIAN
INTERNATIONAL BOUNDARY
U.S. Dept of Agriculture
Blister Rust Control
Traced by M.L. Nelson
From Forest Service Map
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R 3 E
KOOTENAI RIVER
BONNERS FERRY
SHILOH R.S.
SMITH CR R.S.
SANDPOINT
PEND OREILLE LAKE
CLARK FORK
IDAHO
MONTANA
BOUNDARY CR
SMITH CR
CANYON CREEK
LONG CANYON
PARKER CR
BALL CREEK
LION CREEK
MYRTLE CREEK
TWO MOUTH CREEK
SNOW CREEK
CARIBOU CREEK
FALL CREEK
PACK RIVER
HELLROARING CREEK
GROUSE CREEK
DEEP CREEK
SAND CREEK
BOULDER CREEK
NORTH CALLAHAN CR
SOUTH CALLAHAN CR
MIDDLE FK EAST RIVER
LIGHTNING CR
RAPID
TROUT CR
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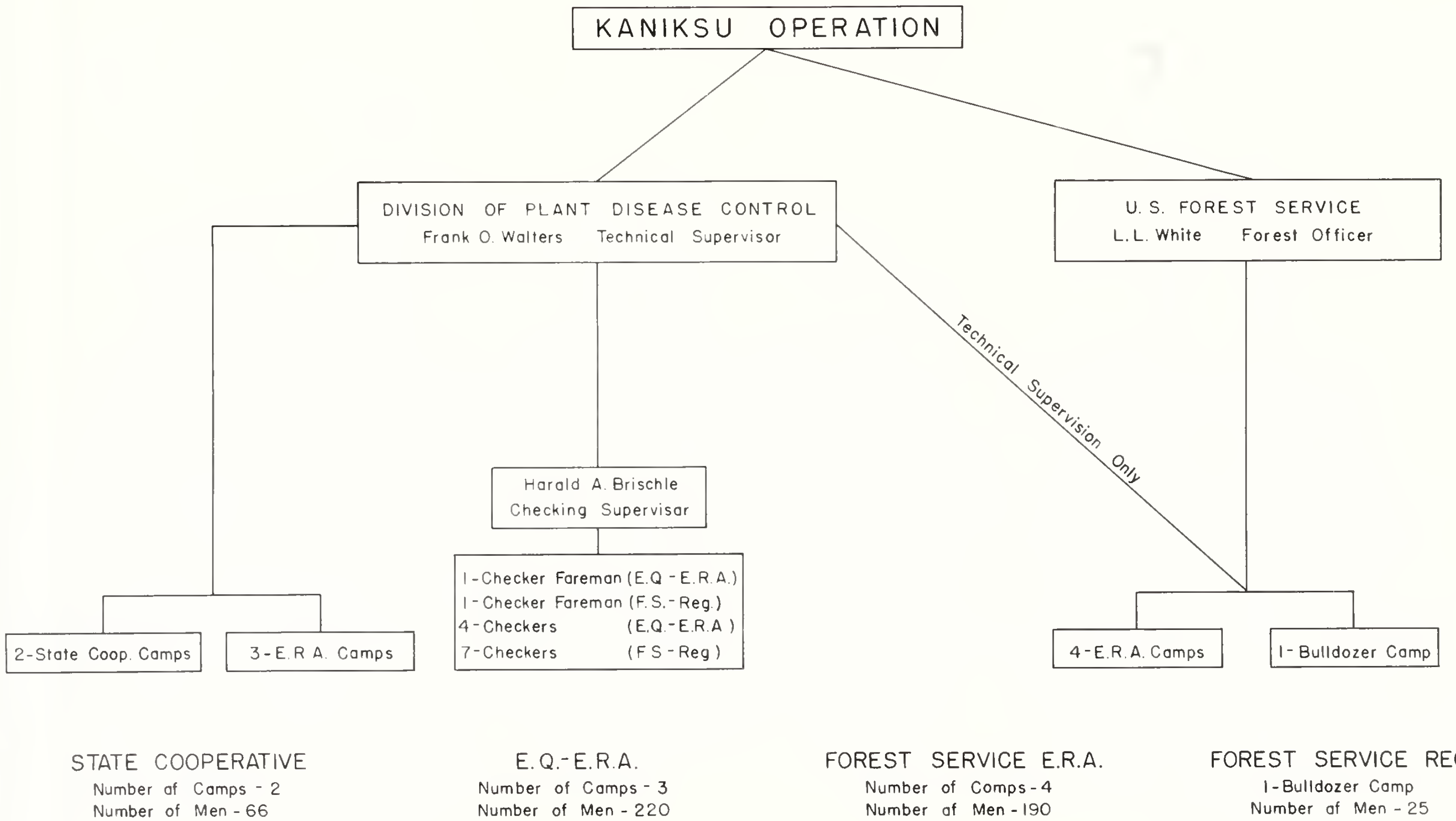
ORGANIZATION CHART



Tatal Number af Men on Blister Rust Work - 481

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

W 2090, W 2091-1 and W 2093. Series showing area to be drained, action of the powder and the resulting drainage ditch

[illegible]

Uniform production [illegible]

[illegible]

<u>[illegible]</u>

At the request of the [illegible] season a party of [illegible] survey of [illegible] Bureau [illegible] the [illegible]

[illegible]

[illegible]

<u>[illegible]</u>

The [illegible] of the [illegible] and the [illegible]

W 2299 and 2301. Heavy growth of grass and harvesting of the hay on areas cleared by bulldozer in 1935.

TABLE NO. 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1937
KANIKSU OPERATION

Cooperating Agency	Appropriation	Amount
Forest Service	Regular	$ 27,[illegible]
	ERA	34,950.81
	Total	6[illegible]
Bureau of Entomology and Plant Quarantine	Regular	[illegible]
	ERA	[illegible]
	Total	[illegible]
State of Idaho	State of Idaho	[illegible]
Total Expenditures	All Appropriations	$[illegible]

TABLE NO. 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1937
KANIKSU OPERATION

Item	Forest Service			Bureau of Entomology and Plant Quarantine			State of Idaho
	Regular	ERA	Total	Regular	ERA	Total	
Salaries, [illegible]	$ 1,204.96	$	$ 1,204.96	$4,833.20	$ 2,870.38	$ 7,695.[illegible]	$
Purchases, [illegible]	6,385.24	2,523.34	8,908.18		9,259.77	[illegible]	
Travel, [illegible]	10,2[illegible].57	25,09[illegible].36	35,[illegible].93	333.00	69,217.99	70,5[illegible]	[illegible]
[illegible]	1,6[illegible]	[illegible]	10,[illegible].07	454.[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]		5,050.[illegible]		[illegible]	[illegible]	
[illegible]					[illegible]	[illegible]	
[illegible]	[illegible]		[illegible]		[illegible]		

SUMMARY OF RIBES ERADICATION, 1937
KANIKSU OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Total Acres	Total Effective Man Days	Total Ribes	Ribes Remaining Per Acre	
						Bushes	Live Stem
Open Reproduction	8,077	4,378	12,455	8,631	1,856,481	1.8	4.2
Dense Reproduction	671		671	497	94,582	1.7	5.7
Open Pole	8,777	1,704	10,481	2,441	197,073	.9	2.4
Dense Pole	517	572	1,089	167	13,816	1.2	3.5
Open Mature	7,279	1,251	8,530	1,642	275,262	.6	2.1
Dense Mature	505	125	630	170	8,227	.2	2.9
Cut Over	248	264	512	285	65,120	1.0	2.7
Brush		296	296	140	9,430	.5	1.0
Subalpine		50	50	13	588	1.5	10.0
All Upland	26,074	8,640	34,714	13,986	2,520,579	1.2	3.1
Stream (Hand)	1,011	1,569	2,580	3,089	451,763	2.5	6.4
Stream (Machine)	161		161	1,798	179,576		
All Stream	1,172	1,569	2,741	4,887	631,339	2.5	6.4
All Types	27,246	10,209	37,455	18,873	3,151,918	1.5	3.9

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man Days	Ribes	Bushes	Live Stem
Open Reproduction	8,077	5,157	1,195,106	.64	148	1.6	3.8
Dense Reproduction	671	497	94,582	.74	141	1.7	5.7
Open Pole	8,777	1,484	100,192	.17	11	.7	3.2
Dense Pole	517	7	1,627	.01	3	1.4	3.6
Open Mature	7,279	752	163,893	.10	23	.6	1.8
Dense Mature	505	106	2,871	.21	6	.5	2.2
Cut Over	248	184	54,028	.74	218	2.0	4.0
All Upland	26,074	8,187	1,612,299	.31	62	1.0	2.8
Stream (Hand)	1,011	1,381	188,998	1.37	187	2.1	6.5
Stream (Machine)	161	1,798	179,576	11.17	1,115		
All Stream	1,172	3,179	368,574	2.71	314	2.1	6.5
All Types	27,246	11,366	1,980,873	.42	73	1.2	3.2

TABLE NO. 3B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis: Man Days	Per Acre Basis: Ribes	Ribes Remaining Per Acre: Bushes	Ribes Remaining Per Acre: Live Stem
Open Reproduction	4,378	3,474	661,375	.79	151	2.5	5.5
Open Pole	1,704	957	96,881	.56	57	2.2	3.7
Dense Pole	572	160	12,189	.28	21	1.0	3.4
Open Mature	1,251	890	111,369	.71	89	1.3	3.7
Dense Mature	125	64	5,356	.51	43	2.0	10.0
Cut Over	264	101	11,092	.38	42	.5	1.7
Brush	296	140	9,430	.47	32	.5	1.0
Subalpine	50	13	588	.26	12	1.5	10.0
All Upland	8,640	5,799	908,280	.67	105	2.0	4.4
Stream (Hand)	1,569	1,708	262,765	1.09	167	2.6	6.4
All Stream	1,569	1,708	262,765	1.09	167	2.6	6.4
All Types	10,209	7,507	1,171,045	.74	115	2.1	5.2

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1937
KANIKSU OPERATION

State	Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Idaho	First	EQ-ERA	13,919	3,574	208,695	.26	15
		FS-ERA	4,699	2,768	681,524	.59	145
		FS-Bulldozer	161	1,798	179,576	11.17	1,115
		State Coop.	8,467	3,226	911,078	.38	108
		Total	27,246	11,366	1,980,873	.42	73
	Second	EQ-ERA	6,832	4,938	917,379	.72	134
		FS-ERA	1,181	762	76,228	.65	65
		State Coop.	247	129	22,674	.52	92
		Total	8,260	5,829	1,016,281	.71	123
	All Workings	EQ-ERA	20,751	8,512	1,126,074	.41	54
		FS-ERA	5,880	3,530	757,752	.60	129
		FS-Bulldozer	161	1,798	179,576	11.17	1,115
		State Coop.	8,714	3,355	933,752	.38	107
		Total	35,506	17,195	2,997,154	.48	84
Washington	Second	FS-ERA	1,949	1,678	154,764	.86	79
Idaho and Washington	First	EQ-ERA	13,919	3,574	208,695	.26	15
		FS-ERA	4,699	2,768	681,524	.59	145
		FS-Bulldozer	161	1,798	179,576	11.17	1,115
		State Coop.	8,467	3,226	911,078	.38	108
		Total	27,246	11,366	1,980,873	.42	73
	Second	EQ-ERA	6,832	4,938	917,379	.72	134
		FS-ERA	3,130	2,440	230,992	.78	74
		State Coop.	247	129	22,674	.52	92
		Total	10,209	7,507	1,171,045	.74	115
	All Workings	EQ-ERA	20,751	8,512	1,126,074	.41	54
		FS-ERA	7,829	5,208	912,516	.67	117
		FS-Bulldozer	161	1,798	179,576	11.17	1,115
		State Coop.	8,714	3,355	933,752	.38	107
		Total	37,455	18,873	3,151,918	.50	84

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1937
KANIKSU OPERATION

		Number of Acres Worked								
		By Forest Service		By Bureau of Entomology and Plant Quarantine			Total			
State	Working	Forest Service	Private	Forest Service	State	Private	Forest Service	State	Private	Total
Idaho	First	2,963	1,897		18,648	3,738	2,963	18,648	5,635	27,246
	Second	723	458	1,794	3,867	1,418	2,517	3,867	1,876	8,260
	Total	3,686	2,355	1,794	22,515	5,156	5,480	22,515	7,511	35,506
Washington	Second	1,128	821				1,128		821	1,949
	Total	1,128	821				1,128		821	1,949
Total	First	2,963	1,897		18,648	3,738	2,963	18,648	5,635	27,246
	Second	1,851	1,279	1,794	3,867	1,418	3,645	3,867	2,697	10,209
	Total	4,814	3,176	1,794	22,515	5,156	6,608	22,515	8,332	37,455

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1937
KANIKSU OPERATION

Eradication Type	Average Results For All Areas									
	Acres in Checked Area	Acres Checked	Ribes per Acre						All Species	
			Ribes lacustre		Ribes viscosissimum		Ribes inerme			
			Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem
Open Reproduction	10,928	386	.7	1.7	1.1	2.5			1.8	4.2
Dense Reproduction	671	26	1.3	3.9	.4	1.8			1.7	5.7
Open Pole	10,481	328	.3	1.1	.6	1.3			.9	2.4
Dense Pole	1,089	40	1.1	3.1	.1	.4			1.2	3.5
Open Mature	8,385	257	.5	1.9	.1	.3			.6	2.1
Dense Mature	562	21	.1	1.8	.1	1.1			.2	2.9
Cut Over	512	21	.9	2.2	.1	.5			1.0	2.7
Brush	296	12	.5	1.0					.5	1.0
Subalpine	50	2	1.5	10.0					1.5	10.0
All Upland	32,974	1,093	.6	1.7	.6	1.4			1.2	3.1
Stream	2,462	334	2.1	4.7	.1	.1	.3	1.6	2.5	6.4
All Types	35,436	1,427	.9	2.4	.5	1.1	.1	.4	1.5	3.9

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1937
KANIKSU OPERATION

Working	Eradication Type	Acres	Ribes by Species			Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	
First	Open Reproduction	8,077	296,839	888,759	9,508	1,195,106
	Dense Reproduction	671	39,225	21,547	33,810	94,582
	Open Pole	8,777	45,495	51,495	3,202	100,192
	Dense Pole	517	868	759		1,627
	Open Mature	7,279	101,108	54,105	8,680	163,893
	Dense Mature	505	2,871			2,871
	Cut Over	248	31,415	22,339	274	54,028
	All Upland	26,074	517,821	1,039,004	55,474	1,612,299
	Stream	1,172	161,000	22,429	185,145	368,574
	All Types	27,246	678,821	1,061,433	240,619	1,980,873
Second	Open Reproduction	4,378	200,535	440,238	20,602	661,375
	Open Pole	1,704	55,110	39,803	1,968	96,881
	Dense Pole	572	9,495	2,404	290	12,189
	Open Mature	1,251	57,327	51,571	2,471	111,369
	Dense Mature	125	3,971	727	658	5,356
	Cut Over	264	2,603	270	8,219	11,092
	Brush	296	4,481	4,913	36	9,430
	Subalpine	50	461	127		588
	All Upland	8,640	333,983	540,053	34,244	908,280
	Stream	1,569	172,258	22,270	68,237	262,765
	All Types	10,209	506,241	562,323	102,481	1,171,045
All Workings	Open Reproduction	12,455	497,374	1,328,997	30,110	1,856,481
	Dense Reproduction	671	39,225	21,547	33,810	94,582
	Open Pole	10,481	100,605	91,298	5,170	197,073
	Dense Pole	1,089	10,363	3,163	290	13,816
	Open Mature	8,530	158,435	105,676	11,151	275,262
	Dense Mature	630	6,842	727	658	8,227
	Cut Over	512	34,018	22,609	8,493	65,120
	Brush	296	4,481	4,913	36	9,430
	Subalpine	50	461	127		588
	All Upland	34,714	851,804	1,579,057	89,718	2,520,579
	Stream	2,741	333,258	44,699	253,382	631,339
	All Types	37,455	1,185,062	1,623,756	343,100	3,151,918

SUMMARY OF RIBES ERADICATION, 1923-1937
KANIKSU OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Total Acres	Total Effective Man Days	Total Ribes
Open Reproduction	107,966	5,672	113,638	62,855	18,890,882
Dense Reproduction	21,025	1,016	22,041	9,393	1,352,927
Open Pole	86,100	7,634	93,734	26,827	3,892,588
Dense Pole	19,383	1,605	20,988	3,506	374,423
Open Mature	101,014	1,652	102,666	23,147	4,808,847
Dense Mature	29,268	125	29,393	3,319	372,510
Cut Over	5,293	264	5,557	1,808	538,842
Brush	3,599	330	3,929	1,281	347,006
Burn	1,132		1,132	1,354	947,874
Subalpine	1,613	50	1,663	712	135,759
Meadow-Field	60		60		
All Upland	376,453	18,348	394,801	134,202	31,661,658
Stream (Hand)	18,308	3,353	21,661	36,162	7,814,199
Stream (Slash)	576		576	4,994	288,000
Stream (Machine)	757		757	4,874	477,576
All Stream	19,641	3,353	22,994	46,030	8,579,775
All Types	396,094	21,701	417,795	180,232	40,241,433

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Open Reproduction	107,966	58,880	18,183,518	.55	168
Dense Reproduction	21,025	8,891	1,328,208	.42	63
Open Pole	86,100	24,390	3,701,946	.28	43
Dense Pole	19,383	3,143	343,101	.16	18
Open Mature	101,014	22,002	4,678,342	.22	46
Dense Mature	29,268	3,255	367,154	.11	13
Cut Over	5,293	1,707	527,750	.32	100
Brush	3,599	1,104	336,107	.31	93
Burn	1,132	1,354	947,874	1.20	837
Subalpine	1,613	699	135,171	.43	84
Meadow-Field	60				
All Upland	376,453	125,425	30,549,171	.33	81
Stream (Hand)	18,308	30,360	7,151,770	1.66	391
Stream (Slash)	576	4,994	288,000	8.67	500
Stream (Machine)	757	4,874	477,576	6.44	631
All Stream	19,641	40,228	7,917,346	2.05	403
All Types	396,094	165,653	38,466,517	.42	97

TABLE NO. 8B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Open Reproduction	5,672	3,975	707,364	.70	125
Dense Reproduction	1,016	502	24,719	.49	24
Open Pole	7,634	2,437	190,642	.32	25
Dense Pole	1,605	363	31,322	.23	20
Open Mature	1,652	1,145	130,505	.69	79
Dense Mature	125	64	5,356	.51	43
Cut Over	264	101	11,092	.38	42
Brush	330	177	10,899	.54	33
Subalpine	50	13	588	.26	12
All Upland	18,348	8,777	1,112,487	.48	61
Stream (Hand)	3,353	5,802	662,429	1.73	198
All Stream	3,353	5,802	662,429	1.73	198
All Types	21,701	14,579	1,774,916	.67	82

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1923-1937
KANIKSU OPERATION

State	Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis	
						Man Days	Ribes
Idaho	First	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	2,655	4,567	809,115	1.72	305
		FS-NIRA	72,135	23,866	6,432,376	.33	89
		EQ-ERA	66,837	30,542	5,469,909	.46	82
		FS-ERA	14,218	8,690	1,707,162	.61	120
		Cooperative	98,923	25,121	7,680,959	.25	78
		S&P-ECW	112	748	209,356	6.68	1,869
		F-ECW	48,806	27,856	4,674,186	.57	96
		Total	322,482	128,234	28,049,752	.40	87
	Second	FS-NIRA	8,544	2,051	292,658	.24	34
		EQ-ERA	7,928	6,065	980,061	.76	124
		FS-ERA	1,181	762	76,228	.64	64
		Cooperative	247	129	22,674	.52	92
		F-ECW	1,459	3,624	167,134	2.48	114
		Total	19,359	12,631	1,538,755	.65	79
	All Workings	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	2,655	4,567	809,115	1.72	305
		FS-NIRA	80,679	25,917	6,725,034	.32	83
		EQ-ERA	74,765	36,607	6,449,970	.49	86
		FS-ERA	15,399	9,452	1,783,390	.61	116
		Cooperative	99,170	25,250	7,703,633	.25	78
		S&P-ECW	112	748	209,356	6.68	1,869
		F-ECW	50,265	31,480	4,841,320	.63	96
		Total	341,841	140,865	29,588,507	.41	87
Washington	First	FS-Reg.	213	1,043	106,500	4.90	500
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	34,417	12,708	3,858,496	.37	112
		EQ-ERA	2,300	1,455	615,598	.63	268
		F-ECW	9,949	10,502	1,487,913	1.05	149
		Total	73,612	37,419	10,416,765	.51	141
	Second	EQ-ERA	393	270	81,397	.69	207
		FS-ERA	1,949	1,678	154,764	.86	79
		Total	2,342	1,948	236,161	.83	101
	All Workings	FS-Reg.	213	1,043	106,500	4.90	500
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	34,417	12,708	3,858,496	.37	112
		EQ-ERA	2,693	1,725	696,995	.64	259
		FS-ERA	1,949	1,678	154,764	.86	79
		F-ECW	9,949	10,502	1,487,913	1.05	149
		Total	75,954	39,367	10,652,926	.52	140
Idaho and Washington	First	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	2,868	5,610	915,615	1.96	319
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	106,552	36,574	10,290,872	.34	97
		EQ-ERA	69,137	31,997	6,085,507	.46	88
		FS-ERA	14,218	8,690	1,707,162	.61	120
		Cooperative	98,923	25,121	7,680,959	.25	78
		S&P-ECW	112	748	209,356	6.68	1,869
		F-ECW	58,755	38,358	6,162,099	.65	105
		Total	396,094	165,653	38,466,517	.42	97
	Second	FS-NIRA	8,544	2,051	292,658	.24	34
		EQ-ERA	8,321	6,335	1,061,458	.76	128
		FS-ERA	3,130	2,440	230,992	.78	74
		Cooperative	247	129	22,674	.52	92
		F-ECW	1,459	3,624	167,134	2.48	114
		Total	21,701	14,579	1,774,916	.67	82
	All Workings	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	2,868	5,610	915,615	1.96	319
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	115,096	38,625	10,583,530	.34	92
		EQ-ERA	77,458	38,332	7,146,965	.49	92
		FS-ERA	17,348	11,130	1,938,154	.64	112
		Cooperative	99,170	25,250	7,703,633	.25	78
		S&P-ECW	112	748	209,356	6.68	1,869
		F-ECW	60,214	41,982	6,329,233	.70	105
		Total	417,795	180,232	40,241,433	.44	96

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1937
KANIKSU OPERATION

State	Working	Number of Acres Worked by Ownership Classes			Total
		Forest Service	State	Private	
Idaho	First	163,491	97,011	61,980	322,482
	Second	11,517	3,886	3,956	19,359
	All Workings	175,008	100,897	65,936	341,841
Washington	First	40,993	1,780	30,839	73,612
	Second	1,436		906	2,342
	All Workings	42,429	1,780	31,745	75,954
Idaho and Washington	First	204,484	98,791	92,819	396,094
	Second	12,953	3,886	4,862	21,701
	All Workings	217,437	102,677	97,681	417,795

TABLE NO. 11

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1937
KANIKSU OPERATION

State	Ownership Class	Number of Acres		
		Worked	Unworked	Total
Idaho	Forest Service	163,491	116,298	279,789
	Public Domain		1,150	1,150
	Sub-total Federal	163,491	117,448	280,939
	State	97,011	38,949	135,960
	Private	61,980	69,251	131,231
	Total	322,482	225,648	548,130
Washington	Forest Service	40,993	50,440	91,433
	State	1,780		1,780
	Private	30,839	4,292	35,131
	Total	73,612	54,732	128,344
Idaho and Washington	Forest Service	204,484	166,738	371,222
	Public Domain		1,150	1,150
	Sub-total Federal	204,484	167,888	372,372
	State	98,791	38,949	137,740
	Private	92,819	73,543	166,362
	Total	396,094	280,380	676,474

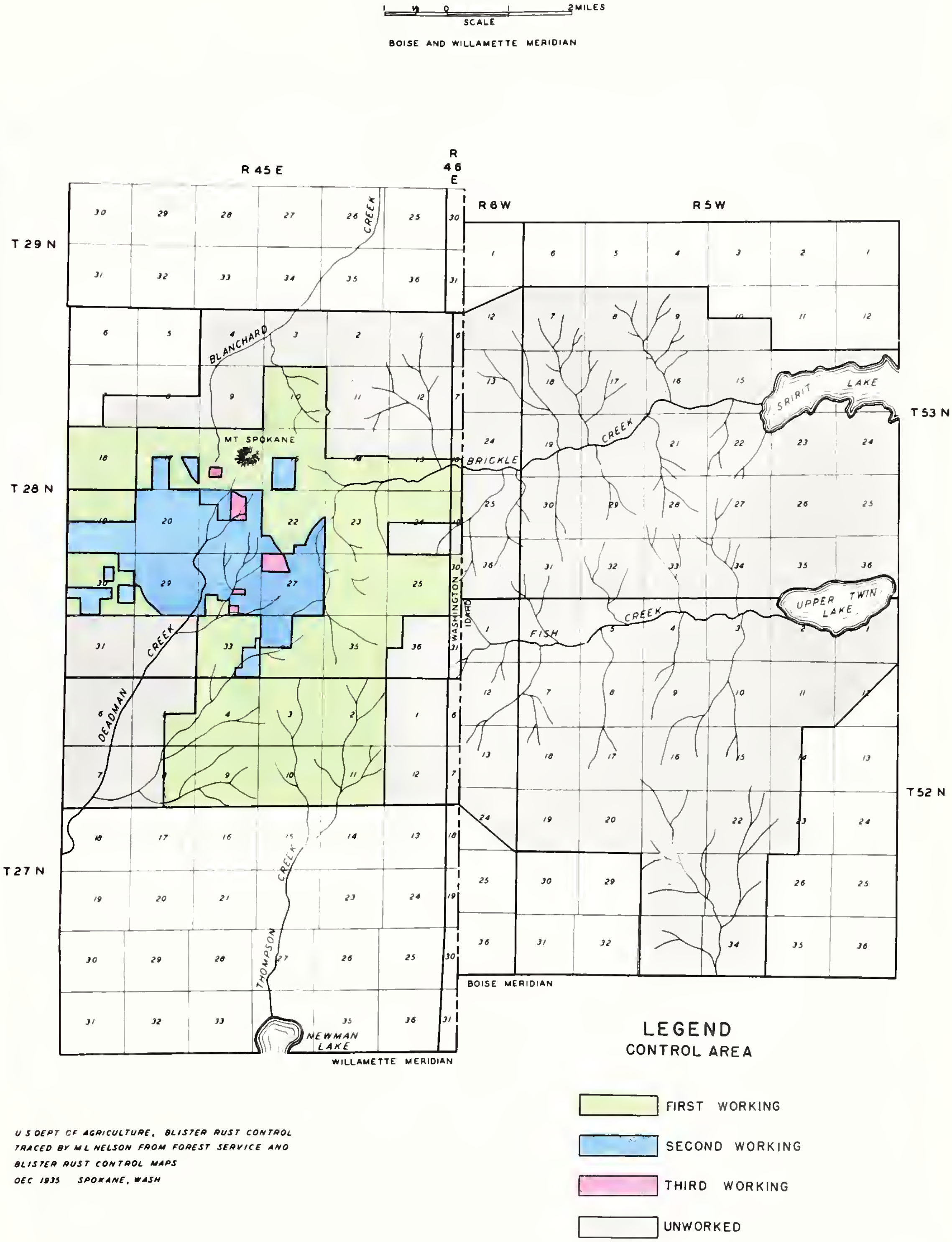
TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1923-1937
KANIKSU OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	Ribes irriguum	Ribes acerifolium	
First	Open Reproduction	107,966	5,476,894	12,555,149	148,528	2,947		18,183,518
	Dense Reproduction	21,025	930,810	331,103	66,295			1,328,208
	Open Pole	86,100	1,824,931	1,667,879	184,030	21,192	3,914	3,701,946
	Dense Pole	19,383	229,248	90,943	22,388	522		343,101
	Open Mature	101,014	3,280,286	1,273,849	122,180		2,027	4,678,342
	Dense Mature	29,268	266,915	68,500	31,739			367,154
	Cut Over	5,293	222,312	262,218	43,220			527,750
	Brush	3,599	68,387	203,158	64,562			336,107
	Burn	1,132	153,516	790,402	3,956			947,874
	Subalpine	1,613	95,041	40,111	19			135,171
	Meadow-Field	60						
	All Upland	376,453	12,548,340	17,283,312	686,917	24,661	5,941	30,549,171
	Stream	19,641	3,924,051	335,120	3,638,591		19,584	7,917,346
	All Types	396,094	16,472,391	17,618,432	4,325,508	24,661	25,525	38,466,517
Second	Open Reproduction	5,672	231,984	453,436	21,944			707,364
	Dense Reproduction	1,016	19,852	3,349	1,518			24,719
	Open Pole	7,634	118,296	64,499	7,847			190,642
	Dense Pole	1,605	26,181	2,665	2,476			31,322
	Open Mature	1,652	72,676	54,625	3,204			130,505
	Dense Mature	125	3,971	727	658			5,356
	Cut Over	264	2,603	270	8,219			11,092
	Brush	330	5,111	4,913	875			10,899
	Subalpine	50	461	127				588
	All Upland	18,348	481,135	584,611	46,741			1,112,487
	Stream	3,353	250,076	23,699	388,654			662,429
	All Types	21,701	731,211	608,310	435,395			1,774,916
All Workings	Open Reproduction	113,638	5,708,878	13,008,585	170,472	2,947		18,890,882
	Dense Reproduction	22,041	950,662	334,452	67,813			1,352,927
	Open Pole	93,734	1,943,227	1,732,378	191,877	21,192	3,914	3,892,588
	Dense Pole	20,988	255,429	93,608	24,864	522		374,423
	Open Mature	102,666	3,352,962	1,328,474	125,384		2,027	4,808,847
	Dense Mature	29,393	270,886	69,227	32,397			372,510
	Cut Over	5,557	224,915	262,488	51,439			538,842
	Brush	3,929	73,498	208,071	65,437			347,006
	Burn	1,132	153,516	790,402	3,956			947,874
	Subalpine	1,663	95,502	40,238	19			135,759
	Meadow-Field	60						
	All Upland	394,801	13,029,475	17,867,923	733,658	24,661	5,941	31,661,658
	Stream	22,994	4,174,127	358,819	4,027,245		19,584	8,579,775
	All Types	417,795	17,203,602	18,226,742	4,760,903	24,661	25,525	40,241,433

MT. SPOKANE OPERATION

BLISTER RUST CONTROL WORKING AREA



U S DEPT OF AGRICULTURE, BLISTER RUST CONTROL
TRACED BY M L NELSON FROM FOREST SERVICE AND
BLISTER RUST CONTROL MAPS
DEC 1935 SPOKANE, WASH

ANNUAL REPORT 1937
M C RILEY

[illegible]

[illegible]
[illegible]

[illegible]

The work in the Mount Spokane Operation during the 1937 season consisted of a continuation of the work [illegible] during the [illegible] season and continued during 1936. Initial ribes eradication [illegible] performed in the southern, [illegible] and [illegible] of the [illegible] in Washington. All work to date has been performed in the State of Washington.

Since money was not immediately available at the start of the season the first camp was not established until May [illegible]. Two [illegible] were in operation with the last camp closing on October 23.

LOCATION AND DESCRIPTION OF AREA

As in previous years, the work centered around Mount Spokane [illegible] the headwaters of Brickle, Deadman and Deep Creeks. The general description of the area as given in the 1935 annual report also applies to the area worked in 1937.

Ribes viscosissimum and R. lacustre were the only species [illegible] any area where ribes eradication was performed this year. [illegible] of the bushes removed were R. viscosissimum.

All classes of working conditions were encountered. [illegible] especially severe in the heart of [illegible] where much cover [illegible] and on one half section where there was much down timber [illegible] bushes were present. On this [illegible] over the bushes [illegible] thousand per acre.

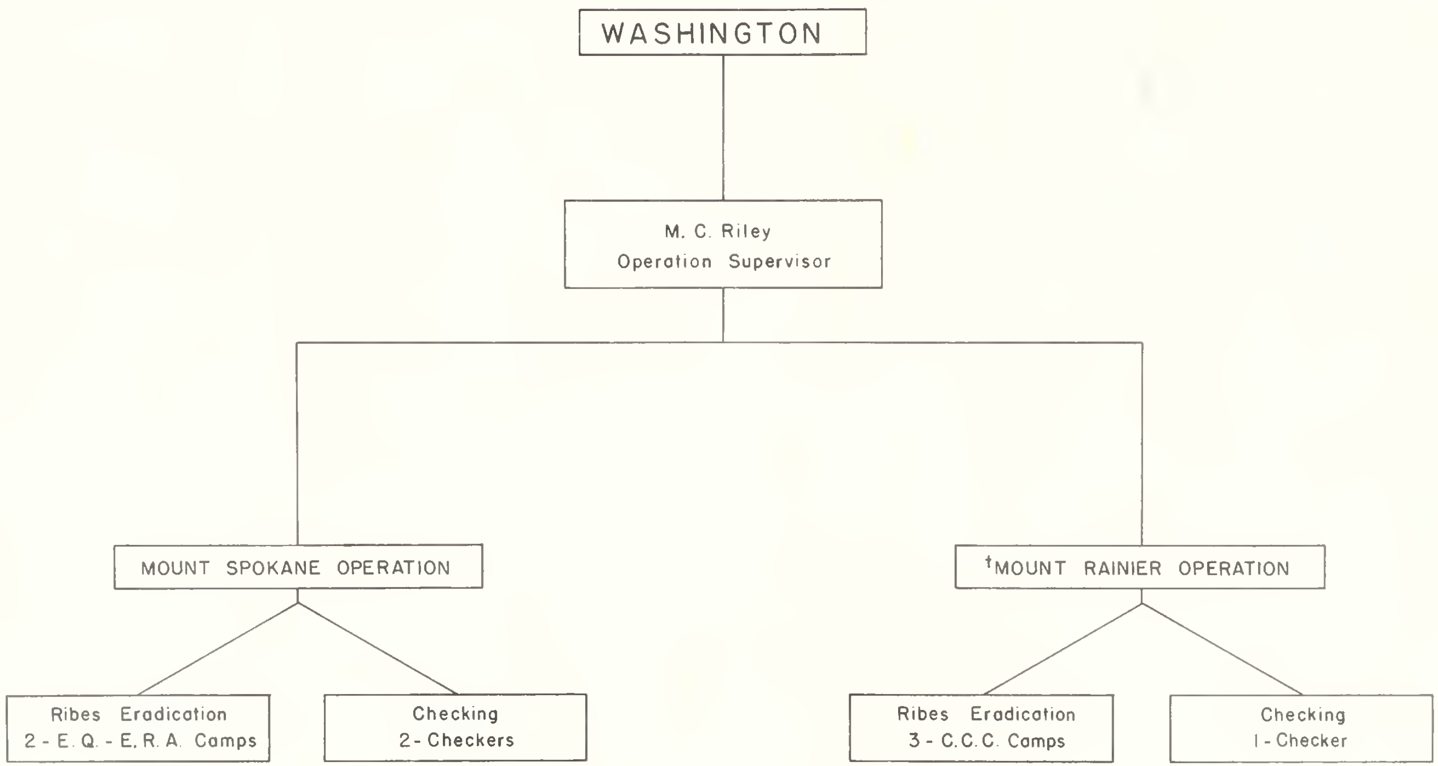
Because of the [illegible] which it was necessary [illegible] year, the choice of camp sites was restricted and as a result [illegible] considerable second working [illegible]. Approximately 65% of the area worked [illegible] year was second working. For all workings the [illegible] ribes per acre.

During the past year the State of Washington has [illegible] considerable acreage in the Mount Spokane area. Sixty percent of the [illegible] from which ribes were removed this year is owned by the State of [illegible]

ORGANIZATION AND ADMINISTRATION

The Mount Spokane Operation was financed [illegible] of the Division of Plant Disease Control under the Emergency [illegible] [illegible] of the lands involved are a part of [illegible] [illegible] Forest [illegible]

ORGANIZATION CHART



Total Number of Men on
Blister Rust Work - 160

Total Number of Men on
Blister Rust Work - 90

†Seperote Report on Mount Roinier Operotion

[illegible]

The [illegible] organization [illegible] the [illegible] of the [illegible] supervisor was [illegible] the Mount [illegible] National Park [illegible].

METHODS AND EQUIPMENT

All eradication was performed by the hand pulling method.

Upon advice from other specialists that the method of [illegible] large R. [illegible] bushes just below the crown gave results [illegible] regard to resprouting, this method was used whenever possible. [illegible] saving in time was thus effected.

The lack of reliable men qualified to act as crew [illegible] necessary to deviate somewhat from the standard 5-man crew. [illegible] rework crews this was a decided handicap.

CHECKING

Checking work was conducted primarily to give the [illegible] immediate and detailed information on the amount and distribution of [illegible] worked areas, to supply information regarding areas low in Ribes [illegible] and to secure data for permanent record maps to facilitate the [illegible] future work. Some time was spent by the checking organization in [illegible] advance scouting to supplement available information, in laying out [illegible] division boundaries and in otherwise assisting the camp boss.

A [illegible] sample check was made in worked areas, running parallel strips 13.2 feet in width at 2-chain intervals. Necessary data for computing and showing the amount and distribution of ribes were recorded along [illegible] strips. The same method was used in ribes-free areas except that the width used was 33 feet in order to give a [illegible] measure before the [illegible] definitely eliminated from crew work. A total of [illegible] acres [illegible] regular check.

On the [illegible] of [illegible] checking work, the cost of regular check was [illegible] per acre.

For the [illegible] check work the same method was used as [illegible] check except that the strip width used was 33 feet. [illegible] given a [illegible] and [illegible] of this was done [illegible] the regular crews of the [illegible].

[illegible]

TABLE NO. [illegible]

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR [illegible]
MOUNT [illegible] OPERATION

Cooperating Agency	Appropriation	[illegible]
Bureau of Entomology and Plant Quarantine	Regular	$ 1,[illegible]
	[illegible]	44,[illegible]
	Total	46,[illegible]
Total Expenditures	All Appropriations	$46,[illegible]

TABLE NO. 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR [illegible]
MOUNT [illegible] OPERATION

Item	Bureau of Entomology and Plant Quarantine		
	Regular	[illegible]	Total
Salaries, perm. emp.	$1,241.95	$ 1,099.95	$ 2,[illegible]
Salaries, temp. emp.		5,624.50	[illegible]
Wages, temp. labor		25,[illegible]	25,[illegible]
Subsistence supplies		2,[illegible]	2,[illegible]
Equipment		[illegible]	[illegible]
Travel and transp.		59[illegible]	[illegible]
Chemicals		[illegible]	[illegible]
Other supplies		[illegible]	[illegible]
Total	$1,[illegible]	$44,[illegible]	[illegible]

Effective [illegible] man day cost: [illegible]
No. [illegible] 37,[illegible] [illegible] per [illegible]
Pounds of [illegible]

SUMMARY OF RIBES ERADICATION, 1937
MOUNT SPOKANE OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Total Effective Man Days	Total Ribes	Ribes Remaining Per Acre	
							Bushes	Live Stem
Open Reproduction	612	1,239	113	1,964	2,509	538,613	5.8	5.5
Dense Reproduction		91		91	171	17,431	5.5	5.3
Open Pole	694	1,780	53	2,527	3,034	723,915	5.0	7.4
Dense Pole	52	44		96	123	15,568	2.0	2.9
Open Mature	110	182	9	301	567	137,729	8.8	15.2
Dense Mature	57	7		64	22	2,726	.4	3.5
Cut Over	316	99	48	463	397	108,895	12.0	5.1
Brush	20	513	15	548	650	42,688	2.7	4.1
Subalpine	84	168		252	130	8,866	2.1	1.9
All Upland	1,945	4,123	238	6,306	7,603	1,596,431	5.5	6.4
Stream (Hand)		72		72	72	9,536	25.0	7.9
All Types	1,945	4,195	238	6,378	7,675	1,605,967	6.6	6.4

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes	Ribes Remaining Per Acre Bushes	Ribes Remaining Per Acre Live Stem
Open Reproduction	612	1,144	256,209	1.87	419	4.3	8.2
Open Pole	694	1,809	562,873	2.61	811	5.7	8.1
Dense Pole	52	73	9,208	1.40	177	1.1	1.1
Open Mature	110	345	96,528	3.14	878	11.1	22.6
Dense Mature	57	20	2,691	.35	47	.5	4.0
Cut Over	316	294	77,381	.93	245	15.9	5.4
Brush	20	22	297	1.10	15		
Subalpine	84	8	613	.10	7	.4	.8
All Types	1,945	3,715	1,005,900	1.91	517	6.8	7.9

TABLE NO. 3B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes	Ribes Remaining Per Acre Bushes	Ribes Remaining Per Acre Live Stem
Open Reproduction	1,239	1,269	262,327	1.02	212	6.3	4.4
Dense Reproduction	91	171	17,431	1.88	192	5.5	5.3
Open Pole	1,780	1,206	160,017	.68	90	4.7	7.2
Dense Pole	44	50	6,360	1.14	145	2.7	4.0
Open Mature	182	215	40,947	1.18	225	7.4	10.9
Dense Mature	7	2	35	.29	5		
Cut Over	99	60	19,061	.61	193	3.0	2.6
Brush	513	611	41,953	1.19	82	2.7	4.1
Subalpine	168	122	8,253	.73	49	2.9	2.4
All Upland	4,123	3,706	556,384	.90	135	4.9	5.6
Stream (Hand)	72	72	9,536	1.00	132	25.0	7.9
All Types	4,195	3,778	565,920	.90	135	6.5	5.7

TABLE NO. 3C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes	Ribes Remaining Per Acre Bushes	Ribes Remaining Per Acre Live Stem
Open Reproduction	113	96	20,077	.85	178	8.3	3.8
Open Pole	53	19	1,025	.36	19	3.2	5.3
Open Mature	9	7	154	.78	17		
Cut Over	48	43	12,453	.90	259	8.1	9.0
Brush	15	17	438	1.13	29		
All Types	238	182	34,147	.76	143	6.7	5.9

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1937
MOUNT SPOKANE OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis	
					Man Days	Ribes
First	EQ-ERA	1,945	3,715	1,005,900	1.91	517
Second	EQ-ERA	4,195	3,778	565,920	.90	135
Third	EQ-ERA	238	182	34,147	.76	143
All Workings	EQ-ERA	6,378	7,675	1,605,967	1.20	252

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1937
MOUNT SPOKANE OPERATION

State	Working	Number of Acres Worked By Bureau of Entomology and Plant Quarantine		Total
		State	Private	
Washington	First	1,628	317	1,945
	Second	2,040	2,155	4,195
	Third	153	85	238
	Total	3,821	2,557	6,378

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1937
MOUNT SPOKANE OPERATION

Eradication Type	Average Results for All Areas								Areas With More Than 25 Feet Live Stem Per Acre		
	Acres in Checked Area	Acres Checked	Ribes Per Acre						Acres	Per Acre	
			Ribes lacustre		Ribes viscosissimum		All Species				
			Bushes	Live Stem	Bushes	Live Stem	Bushes	Live Stem		Bushes	Live Stem
Open Reproduction	1,879	75.16	1.6	1.3	4.2	4.2	5.8	5.5	13	33.9	64.1
Dense Reproduction	91	4.00	2.9	2.9	2.6	2.4	5.5	5.3			
Open Pole	2,527	103.66	1.8	2.1	3.2	5.3	5.0	7.4			
Dense Pole	96	3.96	2.0	2.9			2.0	2.9			
Open Mature	240	9.60	3.2	4.1	5.6	11.1	8.8	15.2	35	24.3	47.1
Dense Mature	57	2.30			.4	3.5	.4	3.5			
Cut Over	463	18.56	5.4	1.7	6.6	3.4	12.0	5.1			
Brush	548	20.84	.8	1.4	1.9	2.7	2.7	4.1			
Subalpine	252	9.91	1.3	.4	.8	1.5	2.1	1.9			
All Upland	6,153	247.99	1.9	1.9	3.6	4.5	5.5	6.4	48	26.9	51.7
Stream (Hand)	72	13.19	24.9	7.6	.1	.3	25.0	7.9			
All Types	6,225	261.18	3.1	1.9	3.5	4.5	6.6	6.4	48	26.9	51.7

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1937
MOUNT SPOKANE OPERATION

Working	Eradication Type	Acres	Ribes by Species: Ribes lacustre	Ribes by Species: Ribes viscosissimum	Total Ribes
First	Open Reproduction	612	84,640	171,569	256,209
	Open Pole	694	287,743	275,130	562,873
	Dense Pole	52	1,878	7,330	9,208
	Open Mature	110	27,181	69,447	96,628
	Dense Mature	57	2,530	161	2,691
	Cut Over	316	52,095	25,286	77,381
	Brush	20	266	31	297
	Subalpine	84	223	390	613
	All Types	1,945	456,556	549,344	1,005,900
Second	Open Reproduction	1,239	57,577	204,750	262,327
	Dense Reproduction	91	10,921	6,510	17,431
	Open Pole	1,780	59,232	100,785	160,017
	Dense Pole	44	1,215	5,145	6,360
	Open Mature	182	8,965	31,982	40,947
	Dense Mature	7	20	15	35
	Cut Over	99	5,060	14,001	19,061
	Brush	513	14,686	27,267	41,953
	Subalpine	168	4,358	3,895	8,253
	All Upland	4,123	162,034	394,350	556,384
	Stream	72	8,814	722	9,536
	All Types	4,195	170,848	395,072	565,920
Third	Open Reproduction	113	9,561	10,516	20,077
	Open Pole	53	626	399	1,025
	Open Mature	9	54	100	154
	Cut Over	48	8,578	3,875	12,453
	Brush	15	140	298	438
	All Types	238	18,959	15,188	34,147
All Workings	Open Reproduction	1,964	151,778	386,835	538,613
	Dense Reproduction	91	10,921	6,510	17,431
	Open Pole	2,527	347,601	376,314	723,915
	Dense Pole	96	3,093	12,475	15,568
	Open Mature	301	36,200	101,529	137,729
	Dense Mature	64	2,550	176	2,726
	Cut Over	463	65,733	43,162	108,895
	Brush	548	15,092	27,596	42,688
	Subalpine	252	4,581	4,285	8,866
	All Upland	6,306	637,549	958,882	1,596,431
	Stream	72	8,814	722	9,536
	All Types	6,378	646,363	959,604	1,605,967

SUMMARY OF RIBES ERADICATION, 1935-1937
MOUNT SPOKANE OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Total Effective Man Days	Total Ribes
Open Reproduction	4,179	1,627	113	5,919	12,492	2,951,461
Dense Reproduction	282	131		413	641	160,459
Open Pole	7,523	1,959	53	9,535	9,371	2,292,361
Dense Pole	623	85		708	377	65,112
Open Mature	1,018	207	9	1,234	2,668	523,981
Dense Mature	735	70		805	179	33,514
Cut Over	526	146	48	720	996	320,860
Brush	1,475	536	15	2,026	2,272	295,923
Subalpine	515	168		683	456	93,999
All Upland	16,876	4,929	238	22,043	29,452	6,737,670
Stream (Hand)	294	74		368	1,590	515,731
All Types	17,170	5,003	238	22,411	31,042	7,253,401

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Open Reproduction	4,179	10,543	2,583,135	2.52	618
Dense Reproduction	282	405	136,122	1.44	483
Open Pole	7,523	7,950	2,120,731	1.06	282
Dense Pole	623	317	58,388	.51	94
Open Mature	1,018	2,422	480,630	2.38	472
Dense Mature	735	165	33,155	.22	45
Cut Over	526	710	236,846	1.35	450
Brush	1,475	1,620	252,552	1.10	171
Subalpine	515	334	85,746	.65	166
All Upland	16,876	24,466	5,987,305	1.45	355
Stream (Hand)	294	1,499	503,312	5.10	1,712
All Types	17,170	25,965	6,490,617	1.51	378

TABLE NO. 8B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Open Reproduction	1,627	1,853	348,249	1.14	214
Dense Reproduction	131	236	24,337	1.80	186
Open Pole	1,959	1,402	170,605	.72	87
Dense Pole	85	60	6,724	.71	79
Open Mature	207	239	43,197	1.15	209
Dense Mature	70	14	359	.20	5
Cut Over	146	243	71,561	1.66	490
Brush	536	635	42,933	1.18	80
Subalpine	168	122	8,253	.73	49
All Upland	4,929	4,804	716,218	.97	145
Stream (Hand)	74	91	12,419	1.23	168
All Types	5,003	4,895	728,637	.98	146

All third working was done in 1937. See Table No. 3C.

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1935-1937
MOUNT SPOKANE OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis	
					Man Days	Ribes
First	EQ-ERA	17,170	25,965	6,490,617	1.51	378
Second	EQ-ERA	5,003	4,895	728,637	.98	146
Third	EQ-ERA	238	182	34,147	.76	143
All Workings	EQ-ERA	22,411	31,042	7,253,401	1.39	324

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1935-1937
MOUNT SPOKANE OPERATION

Working	Number of Acres Worked by Ownership Classes			Total
	Public Domain	State - Washington	Private	
First	236	4,672	12,262	17,170
Second		2,312	2,691	5,003
Third		153	85	238
All Workings	236	7,137	15,038	22,411

TABLE NO. 11

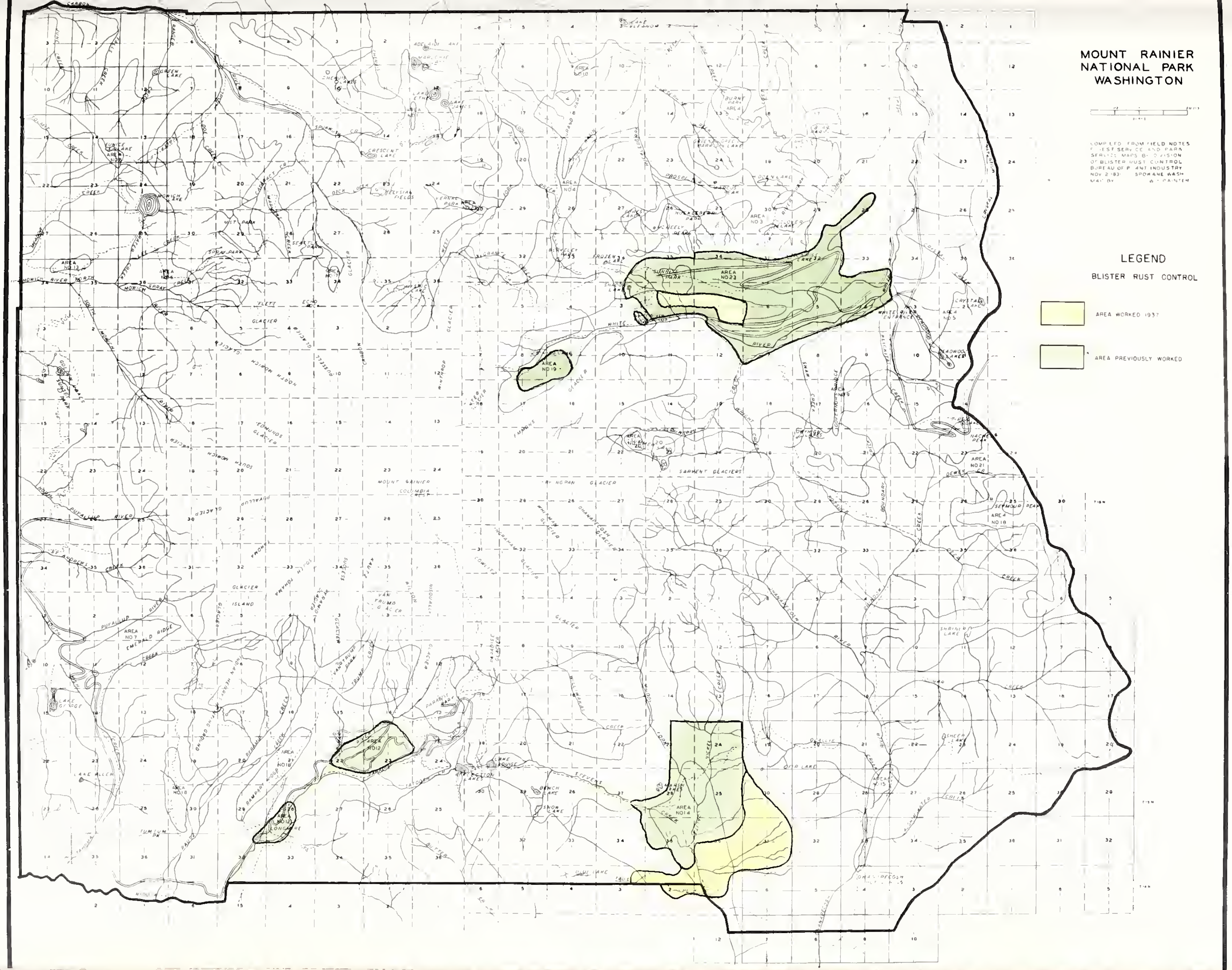
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1935-1937
MOUNT SPOKANE OPERATION

State	Ownership Class	Number of Acres		
		Worked	Unworked	Total
Washington	Public Domain	236	20	256
	State	4,672	1,255	5,927
	Private	12,262	1,702	13,964
	Total	17,170	2,977	20,147
Idaho	Public Domain		963	963
	State		3,080	3,080
	Private		25,310	25,310
	Total		29,353	29,353
Total	Public Domain	236	983	1,219
	State	4,672	4,335	9,007
	Private	12,262	27,012	39,274
	Total	17,170	32,330	49,500

TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1935-1937
MOUNT SPOKANE OPERATION

Working	Eradication Type	Acres	Ribes by Species: Ribes lacustre	Ribes by Species: Ribes viscosissimum	Total Ribes
First	Open Reproduction	4,179	824,466	1,758,669	2,583,135
	Dense Reproduction	282	120,806	15,316	136,122
	Open Pole	7,523	1,060,470	1,060,261	2,120,731
	Dense Pole	623	34,394	23,994	58,388
	Open Mature	1,018	232,682	247,948	480,630
	Dense Mature	735	11,281	21,874	33,155
	Cut Over	526	136,659	100,187	236,846
	Brush	1,475	64,368	188,184	252,552
	Subalpine	515	46,423	39,323	85,746
	All Upland	16,876	2,531,549	3,455,756	5,987,305
	Stream (Hand)	294	474,454	28,858	503,312
	All Types	17,170	3,006,003	3,484,614	6,490,617
Second	Open Reproduction	1,627	93,665	254,584	348,249
	Dense Reproduction	131	15,746	8,591	24,337
	Open Pole	1,959	67,423	103,182	170,605
	Dense Pole	85	1,501	5,223	6,724
	Open Mature	207	9,603	33,594	43,197
	Dense Mature	70	239	120	359
	Cut Over	146	44,285	27,276	71,561
	Brush	536	14,871	28,062	42,933
	Subalpine	168	4,358	3,895	8,253
	All Upland	4,929	251,691	464,527	716,218
	Stream (Hand)	74	11,614	805	12,419
	All Types	5,003	263,305	465,332	728,637
Third	Open Reproduction	113	9,561	10,516	20,077
	Open Pole	53	626	399	1,025
	Open Mature	9	54	100	154
	Cut Over	48	8,578	3,875	12,453
	Brush	15	140	298	438
	All Types	238	18,959	15,188	34,147
All Workings	Open Reproduction	5,919	927,692	2,023,769	2,951,461
	Dense Reproduction	413	136,552	23,907	160,459
	Open Pole	9,535	1,128,519	1,163,842	2,292,361
	Dense Pole	708	35,895	29,217	65,112
	Open Mature	1,234	242,339	281,642	523,981
	Dense Mature	805	11,520	21,994	33,514
	Cut Over	720	189,522	131,338	320,860
	Brush	2,026	79,379	216,544	295,923
	Subalpine	683	50,781	43,218	93,999
	All Upland	22,043	2,802,199	3,935,471	6,737,670
	Stream (Hand)	368	486,068	29,663	515,731
	All Types	22,411	3,288,267	3,965,134	7,253,401


MOUNT RAINIER
NATIONAL PARK
WASHINGTON
LEGEND
BLISTER RUST CONTROL
AREA WORKED 1937
AREA PREVIOUSLY WORKED
AREA NO 23
AREA NO 19
AREA NO 14
AREA NO 12
WHITE RIVER ENTRANCE
MOUNT RAINIER
COLUMBIA CREST
SARVENT GLACIERS
EMERALD RIDGE
SHRINER LAKE
CRESCENT LAKE
GREEN LAKE
MOWICH LAKE

[illegible]

[illegible]

[illegible]

Blister rust control work in Mount Rainier National Park during the 1937 field season [illegible] approximately [illegible] man days were used in Stevens Canyon and one crew of [illegible] men worked on the White River area. The two crews in Stevens Canyon occupied [illegible] camps and the other crew worked direct from the main camp. The season was relatively short since the work was not started until the early part of July and because of inclement weather was terminated about the middle of September.

A representative of the Division of Plant Disease Control helped plan and supervise the work. This Division also supplied the necessary forms and office supplies for the proper reporting and permanent recording of the [illegible]

The work at White River consisted primarily of second working although a small amount of initial work was done. This season saw the completion of first working on the White River area. The work in Stevens Canyon consisted in extending the stream type work on the Muddy Fork of the Cowlitz River and its tributaries and some adjacent upland areas. A small amount of stream type was reworked.

Following satisfactory results obtained on experimental plots it was suggested that ammonium thiocyanate solution be applied to the [illegible] crowns of decapitated Ribes bracteosum bushes. The application of this method in the field demonstrated that it is practical and feasible and if permission could be obtained of the local Park Service officials to use this method an appreciable saving could be effected.

In directing the work on Mount Rainier National Park during the 1937 field season, the Bureau of Entomology and Plant Quarantine expended a total of $[illegible] for travel expenses and supervisory time.

Of the following tables which give the results of the Ribes eradication work, Table No. [illegible] is a complete breakdown of all work done to date. These figures represent an adjustment of those given in previous annual reports since new maps and checking data are now available which make possible more accurate acreage figures for various types than was possible when the reports were compiled.

TABLE NO. 1

SUMMARY OF RIBES ERADICATION, 1937
MOUNT RAINIER NATIONAL PARK

Working	Area	Eradication Type	Acres	Effective Man Days	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes bracteosum	Ribes watsonianum	Ribes acerifolium	Ribes sanguineum	Total Ribes	Per Acre Basis: Man Days	Per Acre Basis: Ribes
First	Stevens Canyon	Open Reproduction	1,546	97	12,417		3,657			7,915	23,989	.06	16
		Open Pole	170				R i b e s	F r e e					
		All Upland	1.716	97	12,417		3,657			7,915	23,989	.05	14
		Stream	232	1,174	41,916	2,050	156,366			3,921	204,253	5.06	880
		All Types	1,948	1,271	54,333	2,050	160,023			11,836	228,242	.65	117
	White River	Open Mature	315	258	24,795	12,847			45		37,687	.82	120
	All Areas	Open Reproduction	1,546	97	12,417		3,657			7,915	23,989	.06	16
		Open Pole	170				R i b e s	F r e e					
		Open Mature	315	258	24,795	12,847			45		37,687	.82	120
		All Upland	2,031	355	37,212	12,847	3,657		45	7,915	61,676	.17	30
		Stream	232	1,174	41,916	2,050	156,366			3,921	204,253	5.06	880
		All Types	2,253	1,529	79,128	14,897	160,023		45	11,836	265,929	.68	118
Second	Stevens Canyon	Stream	6	16	2,124		6,206				8,330	2.67	1,388
	White River	Open Pole	1,250	260	630	5,824		1,507	14,494		22,455	.21	18
	All Areas	Open Pole	1,250	260	630	5,824		1,507	14,494		22,455	.21	18
		Stream	6	16	2,124		6,206				8,330	2.67	1,388
		All Types	1,256	276	2,754	5,824	6,206	1,507	14,494		30,785	.22	25
All Workings	Stevens Canyon	Open Reproduction	1,546	97	12,417		3,657			7,915	23,989	.06	16
		Open Pole	170				R i b e s	F r e e					
		All Upland	1,716	97	12,417		3,657			7,915	23,989	.05	14
		Stream	238	1,190	44,040	2,050	162,572			3,921	212,583	5.00	893
		All Types	1,954	1,287	56,457	2,050	166,229			11,836	236,572	.66	121
	White River	Open Pole	1,250	260	630	5,824		1,507	14,494		22,455	.21	18
		Open Mature	315	258	24,795	12,847			45		37,687	.82	120
		All Types	1,565	518	25,425	18,671		1,507	14,539		60,142	.33	38
	All Areas	Open Reproduction	1,546	97	12,417		3,657			7,915	23,989	.06	16
		Open Pole	1,420	260	630	5,824		1,507	14,494		22,455	.18	16
		Open Mature	315	258	24,795	12,847			45		37,687	.82	120
		All Upland	3,281	615	37,842	18,671	3,657	1,507	14,539	7,915	84,131	.19	26
		Stream	238	1,190	44,040	2,050	162,572			3,921	212,583	5.00	893
		All Types	3,519	1,805	81,882	20,721	166,229	1,507	14,539	11,836	296,714	.51	84

TABLE NO. 2

SUMMARY OF RIBES ERADICATION, 1930-1937
MOUNT RAINIER NATIONAL PARK

Working	Area	Eradication Type	Acres	Effective Man Days	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes bracteosum	Ribes watsonianum	Ribes laxiflorum	Ribes acerifolium	Ribes sanguineum	Ribes triste	Total Ribes	Per Acre Basis: Man Days	Per Acre Basis: Ribes
First	Long-mire	Open Reproduction	274	397	40,281		1,101		5,409	5,804			52,595	1.45	192
		Stream	626	1,202	185,687		97,774		53,899	2,838	16		340,214	1.92	543
		All Types	900	1,599	225,968		98,875		59,308	8,642	16		392,809	1.79	436
	Stevens Canyon	Open Reproduction	2,351	218	28,071		15,986				7,915		51,972	.09	22
		Open Pole	170			R	i b	e s	F r	e e					
		All Upland	2,521	218	28,071		15,986				7,915		51,972	.09	21
		Stream	1,174	4,557	69,244	2,055	435,844		914	11	3,940		512,008	3.88	436
		All Types	3,695	4,775	97,315	2,055	451,830		914	11	11,855		563,980	1.29	153
	White River	Open Reproduction	66	50	6,869	239	21	1,133	550	194			9,006	.76	136
		Open Pole	1,870	2,087	173,790	69,529	539	139,238	1,189	10,801	91	744	395,911	1.12	212
		Open Mature	322	264	27,327	12,847			5	45			40,224	.82	125
		All Upland	2,258	2,401	207,976	82,615	560	140,371	1,744	11,040	91	744	445,141	1.06	197
		Stream	423	744	162,856	1,510	4,869	242	8,820	188	98	8	178,591	1.76	422
		All Types	2,681	3,145	370,832	84,125	5,429	140,613	10,564	11,228	189	752	623,732	1.17	233
	Starbo	Open Reproduction	48	21	68	7		7		2,305			2,387	.44	50
		Open Pole	332	262	11,276	6,131		6,723	3,221	16,658			44,009	.79	133
		All Upland	380	283	11,344	6,138		6,730	3,221	18,963			46,396	.74	122
		Stream	46	46	2,663	575		476	546	409			4,669	1.00	102
		All Types	426	329	14,007	6,713		7,206	3,767	19,372			51,065	.77	120
	All Areas	Open Reproduction	2,739	686	75,289	246	17,108	1,140	5,959	8,303	7,915		115,960	.25	42
		Open Pole	2,372	2,349	185,056	75,660	539	145,961	4,410	27,459	91	744	439,920	.99	185
		Open Mature	322	264	27,327	12,847			5	45			40,224	.82	125
		All Upland	5,433	3,299	287,672	88,753	17,647	147,101	10,374	35,807	8,006	744	596,104	.61	110
		Stream	2,269	6,549	420,450	4,140	538,487	718	64,179	3,446	4,054	8	1,035,482	2.89	456
		All Types	7,702	9,848	708,122	92,893	556,134	147,819	74,553	39,253	12,060	752	1,631,586	1.28	212
Second	Long-mire	Open Reproduction	203	97	9,744		1,101						10,845	.48	53
		Stream	453	343	6,431		20,859		387	1,366			29,043	.76	64
		All Types	656	440	16,175		21,960		387	1,366			39,888	.67	61
	Stevens Canyon	Stream	314	684	38,340		64,737						103,077	2.18	328
	White River	Open Reproduction	66	12	221			77					298	.18	5
		Open Pole	1,677	1,220	36,268	8,225	2,176	3,669	16,095	11			66,444	.73	40
		Open Mature	322	47	1,278	2,011							3,289	.15	10
		All Upland	2,065	1,279	37,767	10,236	2,176	3,746	16,095	11			70,031	.62	34
		Stream	384	626	31,508		127		5				31,640	1.63	82
		All Types	2,449	1,905	69,275	10,236	2,303	3,746	16,100	11			101,671	.79	42
	All Areas	Open Reproduction	269	109	9,965		1,101	77					11,143	.41	41
		Open Pole	1,677	1,220	36,268	8,225	2,176	3,669	16,095	11			66,444	.73	40
		Open Mature	322	47	1,278	2,011							3,289	.15	10
		All Upland	2,268	1,376	47,511	10,236	3,277	3,746	16,095	11			80,876	.61	36
		Stream	1,151	1,653	76,279		85,723		392	1,366			163,760	1.44	142
		All Types	3,419	3,029	123,790	10,236	89,000	3,746	16,487	1,377			244,636	.89	72
All Workings	Long-mire	Open Reproduction	477	494	50,025		2,202		5,409	5,804			63,440	1.04	133
		Stream	1,079	1,545	192,118		118,633		54,286	4,204	16		369,257	1.43	342
		All Types	1,556	2,039	242,143		120,835		59,695	10,008	16		432,697	1.31	278
	Stevens Canyon	Open Reproduction	2,351	218	28,071		15,986				7,915		51,972	.09	22
		Open Pole	170			R	i b	e s	F r	e e					
		All Upland	2,521	218	28,071		15,986				7,915		51,972	.09	21
		Stream	1,488	5,241	107,584	2,055	500,581		914	11	3,940		615,085	3.52	413
		All Types	4,009	5,459	135,655	2,055	516,567		914	11	11,855		667,057	1.36	166
	White River	Open Reproduction	132	62	7,090	239	21	1,210	550	194			9,304	.47	70
		Open Pole	3,547	3,307	210,048	77,754	2,715	142,907	17,284	10,812	91	744	462,355	.93	130
		Open Mature	644	311	28,605	14,858			5	45			43,513	.48	68
		All Upland	4,323	3,680	245,743	92,851	2,736	144,117	17,839	11,051	91	744	515,172	.85	119
		Stream	807	1,370	194,364	1,510	4,996	242	8,825	188	98	8	210,231	1.70	261
		All Types	5,130	5,050	440,107	94,361	7,732	144,359	26,664	11,239	189	752	725,403	.98	141
	Starbo	Open Reproduction	48	21	69	7		7		2,305			2,387	.44	50
		Open Pole	332	262	11,276	6,131		6,723	3,221	16,658			44,009	.79	133
		All Upland	380	283	11,344	6,138		6,730	3,221	18,963			46,396	.74	122
		Stream	46	46	2,663	575		476	546	409			4,669	1.00	102
		All Types	426	329	14,007	6,713		7,206	3,767	19,372			51,065	.77	120
	All Areas	Open Reproduction	3,008	795	85,254	246	18,209	1,217	5,959	8,303	7,915		127,103	.26	42
		Open Pole	4,049	3,569	221,324	83,885	2,715	149,630	20,505	27,470	91	744	506,364	.88	125
		Open Mature	644	311	28,605	14,858			5	45			43,513	.48	68
		All Upland	7,701	4,675	335,183	98,989	20,924	150,847	26,469	35,818	8,006	744	676,980	.61	88
		Stream	3,420	8,202	496,729	4,140	624,210	718	64,571	4,812	4,054	8	1,199,242	2.40	351
		All Types	11,121	12,877	831,912	103,129	645,134	151,565	91,040	40,630	12,060	752	1,876,222	1.16	169

TABLE NO. [illegible]

SUMMARY OF RIBES ERADICATION BY CLASSES OF [illegible]
MOUNT RAINIER NATIONAL PARK

Working	Class	Acres	Effective Man Days	Total Ribes	[illegible] Man [illegible]	[illegible]
First	NP-Reg.	2,647	3,806	[illegible]	1.44	
	NP-ECW	5,055	6,042	851,415	1.20	
	Total	7,702	9,848	1,631,586	[illegible]	
Second	NP-Reg.	38	72	9,655	[illegible]	
	NP-ECW	3,381	2,957	234,981	[illegible]	
	Total	3,419	3,029	244,636	.89	
All Workings	NP-Reg.	2,685	3,878	789,826	1.44	[illegible]
	NP-ECW	8,436	8,999	1,086,396	1.07	[illegible]
	Total	11,121	12,877	1,876,222	1.16	[illegible]

[illegible]

by

[illegible]

[illegible]

INTRODUCTION

Studies of white pine blister rust in 1937 [illegible] the rust to the east and southeast of the known extent of [illegible] sive pine disease survey in north Idaho on both worked and [illegible] special plot studies designed to give information on various [illegible] of years. The first two subjects are treated in this report which is followed by a discussion of special plot studies by [illegible] Stillinger who [illegible] ants conducted this phase of the work.

A. Scouting for the rust.

During September a party of four men scouted for blister rust on pine and ribes eastward in Montana and southeastward toward Yellowstone Park from known pine infection locations in Idaho. No pine infection was found but ribes infection was located at eleven points on the Bitterroot National Forest, three of which were in Idaho and eight in Montana at three locations on the [illegible] one on the Deerlodge and one on the Gallatin National Forests. A limited amount of scouting on the Absaroka National Forest and in Yellowstone National Park failed to reveal the presence of the rust. The ribes infection on the Gallatin National Forest, however, was within nineteen miles of Yellowstone National Park and twenty-six miles from the Wyoming line. As this scouting work was designed to cover a large amount of territory in a short length of time there is no question that only a small percentage of the locations of ribes infection were found. It is more than likely that ribes infection existed at some locations in Yellowstone National Park this year.

This scouting in 1937 represented the first time that the rust has been found in the West to the east of the Continental Divide. It is the first time, however, that scouting work has been performed over the intervening territory between the Inland Empire and Central Rocky Mountain control areas. Since the primary purpose of the scouting was to ascertain the extent of [illegible] the Central Rocky Mountain Region, the spread map giving locations of ribes infection is shown with the Colorado and Wyoming reports.

B. Pine Disease Survey.

The pine disease survey of 1936 was carried on to determine the average conditions of pine infection in the white pine belt of the Inland Empire. It served this purpose, but this purpose only. In order to procure a fair average it was necessary to sample areas on all parts of each operating [illegible] it was not possible to procure complete information on any area. [illegible] data were taken it was not possible to ascertain any correlation which might exist between the amount of infection and the ribes population. [illegible] data were compiled by totals for [illegible] transects, the percentage of [illegible]

could be determined but not the rate of increase.

The 1937 disease survey was designed to give more complete information on each drainage worked with a view to ascertaining or laying the foundation for adequate information on (1) the amount of infection and the rate of increase of the rust in various types according to quantitative classes of ribes, (2) the effect of ribes eradication through changes in the rate of increase in [illegible] areas following working; (3) the effect of stream type and upland ribes in establishing and intensifying the rust.

The first big job was to ascertain where the rust was located and its extent and intensity. This was accomplished by means of a stream scout over all of the stream type of any drainage. As the primary purpose of this work was to locate the rust, no definite width of strip was kept. Trees under 20 feet in height were inspected where found. In the wider stream types this necessitated crossing from side to side to make sure that the rust is found if it does exist in the drainage. Here a definite width of strip might defeat the primary purpose of this phase of the work.

Where the rust was found side strips one rod wide were run from the stream to the ridge usually at right angles to the stream. On these upland strips ribes, pine and infection data were taken by one-chain transects. Holding to the definite one-rod strip makes possible the computing of ribes data on a per acre basis. The one-chain transect gives a definite relation of ribes to infection over a localized area; when infected trees and no ribes were found on the strip the adjacent territory was scouted until the nearest ribes bush was found. Running the strip at right angles to the stream shows the effect of stream type and upland ribes at various distances from the stream and in various types.

Strips run from infection centers show the spread into the upland from this center but do not show the average conditions for the drainage. By running strips at definite intervals into the upland however where the rust is not known to exist as well as where it does exist on the stream gives a fair average. In order to determine the rate of increase it is necessary to judge the year or years in which individual trees are infected. This can be done only by segregating the data for each infected tree. The year of infection for each tree can then be decided with a fair degree of accuracy and the percentage of infection determined for various years.

The strip survey for 1937 was designed to give basic information on the points noted above. Two-man crews were used generally but in locations of heavy infection three-man crews were sometimes more effective. In unworked areas or areas where ribes eradication work was performed too recently to procure information on the effectiveness of control work the stream scout was completed and all the drainage and upland strips were run from the stream to the ridge at intervals of one quarter to one half mile, although the location of upland strips varied somewhat according to conditions found in the drainage. In the stream scout the number of trees examined, number infected, number of cankers and size by species were recorded. The number of feet of live stem for each bush was recorded in areas where ribes eradication work had been performed. The [illegible]

areas the [illegible]
ribes that the time [illegible] in counting the number [illegible]
was not commensurate with the value of the information obtained. [illegible]
scout, cankers were not recorded by the years of growth on which they [illegible]
As upland strips started at the stream it was felt that the year of growth [illegible]
cankers found on these strips would yield the necessary information on the [illegible]
of increase near the stream and give the necessary comparison with the [illegible]
increase at various distances from the stream.

Trees under 20 feet in height only were examined on both stream [illegible]
and upland strips. On the upland strips the following data were procured by
one-chain transects: number of trees examined, number infected listed individ[illegible]
number of cankers for each infected tree tabulated according to the year of gro[illegible]
infected, the number of ribes bushes, the amount of feet of live stem by spec[illegible]
and the ribes eradication type.

The same data were taken on areas designated for studying the eff[illegible]
ness of control except that cankers found in the stream scout were recorded [illegible]
year of growth on which they were found. Here any change in the rate of [illegible]
in the stream type was decidedly important and the possibility existed that [illegible]
rate of increase in the stream type might tell the story whereas the rate of [illegible]
crease in the upland types might not be significant yet. In other words, [illegible]
felt that not enough time had elapsed since the ribes eradication work was [illegible]
formed to give a definite story in the upland. In areas worked in 1933 [illegible]
the effect of eradication could be judged only by the 1934 infection with [illegible]
a minor amount of 1935 infection. Supposing that the rate of increase [illegible]
after 1933, it might mean that breaking down the ribes population had [illegible]
disease. It might mean however that none of the ribes remaining had [illegible]
be infected in that one year; yet they might become infected and [illegible]
1935, 1936 or 1937 the results of which would not become apparent [illegible]
to tell the story until 1938, 1939 or 1940. For this reason [illegible]
trol work was confined to areas on the [illegible] Joe and Clearwater [illegible]
where ribes eradication work was performed on the upland in [illegible]
work was done in the fall of the year in order to give the [illegible]
as much time as possible to make their appearance. Some work was done on [illegible]
worked in 1933 in case significant results could be obtained. [illegible]
in 1934, 1935 and 1936 to serve as a basis of comparison with [illegible]
previously

[illegible]

The work in 1937 was accomplished with a crew of [illegible]
employed on emergency funds from [illegible] to November 15 and a crew of [illegible]
Forestry students employed on regular [illegible] funds from [illegible]
10. Six men were employed on the Coeur d'Alene National Forest [illegible]
in the fall of the year paid from Coeur d'Alene National Forest funds.

The results accomplished are shown by operations [illegible]

TABLE NO. 1

PINE DISEASE SURVEY, 1937
SUMMARY BY OPERATIONS

	Stream Scout						Upland Strips					
	Miles of Strip	White Pine			Cankers		Miles of Strip	White Pine			Cankers	
Operation		No. Exam.	No. Inf.	Per Cent	Number	Per 100 Trees		No. Exam.	No. Inf.	Per Cent	Number	Per 100 Trees
St. Joe	373	68,668	8,433	12.3	27,453	39.9	437	116,542	11,018	9.4	58,6[illegible]	50.[illegible]
Clearwater	128	28,805	2,710	9.4	8,649	30.0	77	31,564	3,370	10.6	[illegible]	[illegible]
Kaniksu	68	7,971	21	.02	110	1.38	147	83,749	69	.08	[illegible]	[illegible]
Coeur d'Alene	134	38,821	894	2.3	3,465	8.1	18	3,240	379	11.7*	[illegible]	[illegible]
Total	703	144,265	12,058	8.3	39,677	27.5	679	235,095	14,836	6.3	[illegible]	[illegible]

* Percentage and cankers per 100 trees out of proportion on account of small sample on Coeur d'Alene Operation

On the St. Joe operation the [illegible] worked in 1927 in the [illegible] district, on unworked areas in the [illegible] district and in some of the worked and unworked areas in the [illegible] districts.

On the Clearwater operation work was done on the effectiveness of control in the Weitas area, part of which was worked in 1931 and 1932, on the [illegible] and Alder Creek drainages near Headquarters, Idaho where the stream type [illegible] was worked in 1929, 1930 and 1931, and a portion of the upland in 1932 and [illegible] and on the Orofino and Quartz Creek drainages near Pierce, Idaho where [illegible] the stream type was worked in 1931 and 1932, and part of the upland was worked [illegible] 1933. Disease survey work was also performed in unworked areas in the [illegible] Basin and along the North Fork of the Clearwater River.

On the Coeur d'Alene National Forest stream scout work mainly was carried on in the fall. Upland strips were run only in favorable locations, usually in reproduction types as the purpose of this work was primarily to [illegible] infection.

On the Kaniksu National Forest work was done during the summer on areas where special information was requested. Upland strips at 20-chain intervals were run through a rather extensive area in the North and South Forks of [illegible] Creek and through burned areas in the East River drainage. In the fall when it was too late to take ribes data, scouting work was performed in the [illegible] and Trestle Creek drainages and in a portion of the Upper West Branch drainage.

The figures in Table No. 1 are significant only in showing the amount of work accomplished as totals include both worked and unworked areas. Significant details are given in the tables following.

The rate of increase in these tables is shown by the percentage of new infection up to 1928, in 1929 and 1930 and for each year since 1930. By [illegible] ing through the percentage of new infection for each year the trend of the increase of the rust can be followed. The new infections are only part of the story, however. Each year some infected trees are reinfected [illegible] in or near infection centers may become infected each year. It is important especially in effectiveness of control studies to observe the trend of [illegible]. The number of trees reinfected is shown in the "previous" column for each year together with the cumulative percentage for all new and previous infections up to that year.

ST. JOE AND CLEARWATER OPERATIONS

Table No. 2 shows the amount of infection and the rate of [illegible] of the rust in some of the unworked areas on the St. Joe and Clearwater [illegible].

On the St. Joe operation the average infection found on the [illegible] scout was 16.8 percent and for the upland strips, which also include a [illegible] sample of stream type, the average was 13.7 percent. [illegible] performed on the Bird Creek drainage, however, on account of the [illegible]

[illegible] of the rust. The figures [illegible] shown in the table [illegible] upland percentages are therefore not comparable. When the upland [illegible] Creek is deleted the average infection for upland strips is 7 [illegible] those drainages where 16.9 percent of the trees examined in the [illegible] were infected.

On the Clearwater operation the only unworked territory on [illegible] disease survey was made was what is known as the Moose City basin [illegible] areas along the North Fork of Clearwater River. Stream scout work only [illegible] formed on the North Fork and tributaries where the average infection [illegible] cent. In the Moose City basin the average infection for stream scout [illegible] percent and for upland strips .9 percent. Most of the infection [illegible] was found near the stream, there has been very little spread to the upland [illegible] stream zone ribes eradication would probably give a high degree of prot[illegible] the area, judging by the amount of infection up to 1934.

Tables Nos. 3 and 4 give preliminary data on the effectiveness [illegible] trol, the main difference in form being that Table No. 4 shows the [illegible] crease for the stream scout as well as for upland strips. Here a di[illegible] the purpose of the work exists. In the drainages shown in Table No. 3 [illegible] eradication work was performed in the upland prior to 1932 with the [illegible] a small area on Long Meadow Creek. The disease survey work was [illegible] the amount of infection in the drainage, the rate of increase in the [illegible] the ribes conditions in areas worked in different years. In these [illegible] disease survey was run too soon after ribes eradication work to [illegible] nite information on the change in the rate of increase of the rust after [illegible] was performed. It was thought however that preliminary indications [illegible] tained in the areas shown in Table No. 4. The possibility existed [illegible] that the results of the survey in the upland might not yield satisfactory [illegible] a lowering of the rate of increase might be due partly to unfavorable [illegible] conditions in the one or two years following ribes eradication. [illegible] complete data were taken on the stream scout in these areas in order [illegible] the rate of increase along streams as well as in the upland.

Table No. 3 shows the amount of infection and rate of increase [illegible] rust according to years when ribes eradication work was performed in [illegible] the drainages in the Elk River and Clarkia districts of the St. [illegible] This table yields little information on the change in rate of increase of [illegible] rust owing to the fact that the areas worked in 1933 can be judged [illegible] 1934 infection. As 1934 was apparently a poor year for spread [illegible] in the rate of increase in 1934 in practically all areas regardless [illegible] were worked. There is a small amount of additional infection [illegible] areas worked in 1933 when they are near the more heavily infected [illegible] Gold Crater Creek. The information contained in this table should [illegible] however, in establishing priority of reworking. For this purpose [illegible] important factors are rust and ribes conditions. The infection [illegible] shown and the ribes data should serve as a valuable supplement [illegible] The ribes data in this table computed on a per acre basis show [illegible] are still meeting ribes eradication standards, but also indicate [illegible] the areas are due for rework.

[illegible] Creek [illegible] occurred [illegible] worked in 1931. [illegible] acres around a heavy center of infection of 1929 origin. [illegible] highly favorable to the rust is evidenced by the fact that [illegible] center attributable to *Ribes petiolare* [illegible] and also by the fact that [illegible] has developed much more slowly in the surrounding territory which [illegible] much later or is yet unworked. While the ribes on the survey [illegible] only four per acre there may have been additional ribes [illegible] were not reported. In any event the increase of the rust following [illegible] dicates that a practically 100 percent job of ribes eradication [illegible] and near these locations in order to insure protection.

Table No. 4 lists areas on the Clearwater and St. Joe [illegible] were designated for effectiveness of control studies. Ribes eradication [illegible] was performed generally earlier than in the areas listed in Table No. 3 [illegible] disease survey was conducted in the fall of the year thus allowing more [illegible] for the 1935 infection to become visible.

The [illegible] area on the Clearwater operation comprises [illegible] Creek and branches from Bear Creek to Johnny Creek including Doris, part of [illegible] and Larch, Cabin, [illegible] and Bighorn Creeks. Both the stream scout and [illegible] strips show that the rust has increased in those areas worked [illegible] Rework is necessary both in the stream and in the upland in order to [illegible] the investment in this area. Here the rust has spread into the upland [illegible] in some of the other areas although in unworked territory the [illegible] a decided increase since 1934 whereas there has been only a slight [illegible] the upland strips. The continued increase in the unworked territory [illegible] place in the heavier infection centers on Doris, Hemlock and [illegible] ously enough in parts of the unworked reproduction type where ribes [illegible] heavy there has been no additional infection since 1932. This [illegible] makes it difficult to ascertain the effectiveness of control [illegible] after working. Worked areas must be contrasted with unworked areas [illegible] areas worked later where the rust has actually increased in order [illegible] significant comparison.

The [illegible] Creek area includes [illegible] Creek from [illegible] upstream, the North and South Forks and Deer Creek; [illegible] Creek [illegible] upstream and Casey, Parallel and Loop Creeks. In all [illegible] type was worked in 1929 and 1930 and the stream type which was worked [illegible] was reworked in 1931. The upland was worked [illegible] the stream type, in 1932, 1933, 1934 or 1935.

The results of the stream scout show that the [illegible] has not stopped the intensification of the rust. It has [illegible] areas in the stream type but not nearly so much [illegible] work had not been done. In the 1934 annual report it was [illegible] stream type work was effective. This statement [illegible] it was based on a [illegible] between these areas and [illegible] stream type work had been [illegible]. In that survey [illegible] for [illegible] transects and the [illegible] of infection [illegible]

[illegible] work [illegible] to [illegible] [illegible] more detailed [illegible] has been a decided [illegible] in the [illegible] reworking. [illegible] occurring [illegible] shows however [illegible] was worked in [illegible] and the upland in [illegible] bring the number of ribes and amount of [illegible] per acre down [illegible] tion standards in order to prevent an increase in infection [illegible] years for spread. [illegible] a check on standards can probably [illegible] 1937 infection becomes apparent.

The Orofino-Quartz Creek area comprised Quartz Creek [illegible] to Orofino Creek and Orofino Creek and branches from Quartz to [illegible] The main branches of Orofino Creek worked were all of [illegible] part of McCauley and Poorman Creeks. In this area [illegible] worked in 1930, 1931 and 1932; the upland in 1933, 1935 and 1936. [illegible] land types are in much better condition and it is felt that [illegible] stream zone would maintain the area in a satisfactory condition [illegible]

On the St. Joe operation work of this type was [illegible] West Fork of St. Maries River with [illegible] strips run in a [illegible] area on the Little East Fork of Emerald Creek. In the area worked [illegible] the West Fork only two trees were infected in 1934, one of which had [illegible] previously. There is no 1934 infection however on the areas worked [illegible] and 1935 and very little in the unworked areas. In the heavier [illegible] Little East Fork of Emerald, however, there is more 1934 and some [illegible] This bears out a general observation that 1934 was not a favorable [illegible] most of the intensification taking place near the heavier centers of [illegible] While some stream zone rework is necessary in this area, [illegible] disease survey indicate that the upland types have been worked [illegible] The effect of the remaining ribes can be ascertained readily when [illegible] more favorable years than 1934 are evidenced.

KANIKSU AND COEUR D'ALENE OPERATIONS

The results of work on the Kaniksu and Coeur d'Alene [illegible] are shown in Tables Nos. 5 and 6, Table No. 5 showing the results of [illegible] scout and Table No. 6 the results [illegible] upland strips. The data are [illegible] years of ribes eradication and by one or more streams or drainages. [illegible] for two or three small streams in the same general area are combined [illegible] in some instances. As no definite width of strip was run, the [illegible] stream scout cannot be computed on a per acre basis. The distance [illegible] given for each classification is shown in miles and chains [illegible] idea of the ribes conditions can be gained from the ribes data. The [illegible] purpose of the stream scout was to locate the rust, and infection [illegible] are shown for each location.

The upland strips on the Coeur d'Alene National Forest [illegible]

[illegible] were run [illegible] the cons[illegible] strips run [illegible] ribes count [illegible] very small. [illegible] area, however, resulted in locating only one bush with [illegible] an amount too small to be expressed on a per acre basis.

The [illegible] on the [illegible] National Forest [illegible] as regards the rust which is light on these particular areas and has not intensified to any extent in either worked or unworked areas. The [illegible] significant however in showing that a high degree of protection has [illegible] the area worked. Practically nineteen miles of strip, or about 38 acres of ground actually covered, in the North Fork of Granite on the [illegible] working of 1934 reveals in 1937 an average of four bushes and 54 feet of live stem [illegible] and no ribes were found on about three miles of strip on the [illegible] working [illegible]. This contrasts with an average of 91 bushes and [illegible] feet of live stem [illegible] on 16 miles of strip, or 32 acres, in unworked area in the same [illegible]. Similarly in the South Fork of Granite area in 1934 working, an average of [illegible] and 46 feet of live stem on 47 miles of strip, or 94 acres, contrasts with an average of 74 bushes and 1,160 feet of live stem on 45 miles, or [illegible] of unworked area. Strips one rod wide were run here at 20 chains [illegible] representing a one and one quarter percent sample of the area.

On the North Fork of East River strips were run for [illegible] in burned areas. The 1931 working quite patently resulted [illegible] of it was reworked in 1937. On this 1937 working the number of ribes and live stem figures cannot be taken as representative as some [illegible] vey strips were run on this area before it was worked. The average of [illegible] and 427 feet of live stem found on about 3[illegible] six years after working [illegible] is contrasted with 75 bushes and 867 feet of live stem in unworked [illegible] which the basis is smaller, about 6 acres of ground actually covered.

The tables discussed herein follow:

TABLE NO. 2

PINE DISEASE SURVEY, 1937
SUMMARY OF UNWORKED AREAS, ST. JOE AND CLEARWATER OPERATIONS

T.	R.	Drainage	Stream Scout: Distance Run Mi.	Stream Scout: Distance Run Ch.	Stream Scout: White Pine No. Exam.	Stream Scout: White Pine No. Inf.	Stream Scout: White Pine Per Cent	Stream Scout: Cankers No.	Stream Scout: Cankers Per 100 Trees	Upland Stripe: Distance Run Mi.	Upland Stripe: Distance Run Ch.	Upland Stripe: White Pine No. Exam.	Upland Stripe: White Pine No. Inf.	Upland Stripe: White Pine Per Cent	Upland Stripe: Cankers No.	Upland Stripe: Cankers Per 100 Trees
		St. Joe Operation														
45N	6E	Stream below Turner Creek	1	30	669	55	8.2	127	19.0		12	53	1	1.9	1	1
45N	6E	Turner Creek	2	68	453	83	18.3	193	42.6	2	7	244	27	11.1	97	39.7
45N	6E	Stream below Bird Creek		50	195	19	9.7	135	69.2	1	6	751	123	16.4	321	42.7
45-46N	7E	Bird Creek								25	65	26,674	6,796	25.5	34,584	130.0
45N	7E	Stream below Bottle Creek		51.5	62	4	6.4	5	8.1		8	3	1	33.3	1	33.3
45N	7E	Bottle Creek		73	406	15	3.7	19	4.7	1	12	199	5	2.5	8	4.0
45N	7E	Malin Creek	1	40	119	61	51.3	335	281.5	8	69	2,055	336	16.4	1,758	85.5
45N	7E	Eagle Creek	3	20	604	280	46.4	1,191	197.2	30	20	7,184	1,004	14.0	2,536	35.4
45N	7-8E	Quartz Creek	8	76	710	130	18.3	563	79.3	46	41	1,999	37	1.9	53	2.6
44-45N	8E	Haggerty and Shady Creeks	1	30	88	25	28.4	116	131.8		68	16	1	6.3	2	12.5
44-45N	8E	Tumbledown Creek	5	20	354	72	20.3	162	45.8	8	9	265	2	0.8	2	0.7
44-45N	8E	Bruin Creek	1	65	116	5	4.31	12	10.3	11	5	904	10	1.1	12	1.3
44-45N	8-9E	Gold Creek	1	22	1,381	301	21.8	820	59.4	51	4	5,741	155	2.7	251	4.4
44N	8-9-10E	Simmons Creek	17	40	3,571	208	5.8	330	9.2	24	7	4,697	14	0.3	24	0.6
44N	5-6E	Upper Sisters, Bonehead, Webfoot	14	32.5	3,238	580	17.9	1,761	54.1	10	43	2,943	239	8.1	816	27.7
44N	6E	Sisters Cr., Hilo to Alpine	2	55	668	134	20.1	456	68.3	3	64	1,260	180	14.3	388	30.8
44N	6E	Hilo Creek	4	3	43	7	16.3	22	51.2							
44N	6E	Bearskull Creek	5	31	170	3	1.8	6	3.5	4	50	1,098	3	0.3	5	0.4
44N	6E	Alpine Creek	9	30	551	54	9.8	106	19.1	1	33	457	8	1.8	13	2.8
44N	7-8E	W. Fk. Bluff Creek	10	45	1,023	158	15.4	401	39.2	4	19	1,841	19	1.0	60	3.3
43-44N	7-8E	E. Fk. Bluff Creek	5	70	3,237	590	18.2	1,354	41.8	4	6	6,684	146	2.2	225	3.4
43N	5E	Little N. Fk. Clearwater	8	47	1,365	346	25.4	2,562	187.7	6	42	2,844	396	13.9	1,175	41.3
43N	5E	Adair Creek	7	75	1,296	346	26.7	1,767	136.3	3	32	1,746	170	9.7	566	32.4
43N	5E	Rocky Run Creek	2	76	398	158	39.7	1,363	342.5	2	75	783	74	9.5	484	61.8
43-44N	6E	Rutledge Creek	7	31.5	2,002	186	9.2	444	22.2	4	62	1,511	82	5.4	127	8.4
43N	6E	Montana Creek	11	5	2,914	493	16.9	3,409	117.0	3	3	102	9	8.8	20	19.6
45-46N	1E	Garveson Creek	1	35	280	170	60.7			1	55	923	130	14.1	416	45.1
44N	1W-1E	Renfro Creek	10	40	1,458	536	36.8			12	67	2,553	437	17.1	1,708	66.9
44-45N	1W-1E	Davis Creek	7	5	1,727	98	5.7			1	37	718	11	1.5	29	4.0
43N	1W-1E	Little Carpenter Creek	7	35	1,134	3	0.3	3	0.3							
		Total	164	0.5	30,236	5,119	16.9	17,651	65.9**	275	45	76,228	10,416	13.7	45,782	60.1
		Clearwater Operation														
40-41N	10-11E	E. Fk. Clearwater & Branches	26	1	2,928	499	17.0	2,568	87.7							
39-40N	11E	Moose Creek	2	75	1,095	71	6.5	102	9.3	4	29	2,315	9	0.4	15	0.6
40N	11E	Independence Creek	1	40	77					4	68	2,699	5	0.2	5	0.2
39-40N	11E	Ozier Creek	4	40	403	28	6.9	70	17.4	2	56	786	40	5.1	70	8.9
		Total	34	76	4,502	598	13.3	2,740	60.9	10	153	5,800	54	0.9	90	1.5

Upland Stripe — Number and Per Cent of Trees Infected (New) and Reinfected (Previous) by Years

Drainage	Up to 1928 No.	Up to 1928 Per Cent	1929-1930 New	Per Cent	Prev.	Per Cent	1931 New	Per Cent	Prev.	Per Cent	1932 New	Per Cent	Prev.	Per Cent	1933 New	Per Cent	Prev.	Per Cent	1934 New	Per Cent	Prev.	Per Cent
St. Joe Operation																						
Stream below Turner Creek			1	1.9																		
Turner Creek	3	1.2	5	3.3	1	3.6	9	7.0	1	7.8	8	10.2	3	12.3	2	11.1	1	13.5			1	13.9
Stream below Bird Creek			23	3.1			34	7.6	7	8.5	46	13.7	9	15.8	19	16.2			1	16.4		
Bird Creek	156	0.6	1,342	5.6	46	5.79	1,814	12.4	210	13.4	2,606	22.2	62	23.4	642	25.3	1,049	30.5	36	25.5	145	31.1
Stream below Bottle Creek											1	33.3										
Bottle Creek			2	1.0							2	2.0	1	2.5			1	3.0	1	2.5		
Malin Creek	1	0.04	46	2.3			68	5.6	2	5.7	158	13.3	21	14.4	62	16.3	18	18.3	1	16.3	9	18.8
Eagle Creek	6	0.08	171	2.5			266	6.2	11	6.3	413	11.9	50	12.8	146	14.0	72	15.8	2	14.0	2	15.9
Quartz Creek	1	0.05	3	0.2			13	0.8			14	1.5			6	1.8						
Haggerty and Shady Creeks							1	6.2														
Tumbledown Creek							2	0.7														
Bruin Creek			3	0.3			3	0.7			3	1.0			1	1.1						
Gold Creek			26	0.4			45	1.2	1	1.2	67	2.4	4	2.5	16	2.7	2	2.8	1	2.7	1	2.8
Simmons Creek			2	0.04			3	0.1			8	0.3			1	0.3					1	0.3
Upper Sisters, Bonehead, Webfoot	8	0.3	59	2.3	2	2.34	71	4.7	3	4.9	82	7.5	9	11.3	16	8.0	22	12.6	3	8.1	9	13.0
Sisters Cr., Hilo to Alpine			12	0.9			30	3.3			65	8.5	3	8.7	57	13.0	6	13.7	16	14.3	5	15.4
Hilo Creek																						
Bearskull Creek							1	0.1			1	0.2			1	0.3						
Alpine Creek			1	0.2			2	0.7			4	1.5	1	1.7	1	1.7	2	2.4				
W. Fk. Bluff Creek	1	0.05	3	0.2			4	0.4	1	0.5	9	0.9			2	1.0	4	1.3			3	1.5
E. Fk. Bluff Creek	5	0.07	20	0.4			42	1.0	3	1.05	57	1.8	3	1.9	18	2.1	1	2.2	4	2.2	3	2.3
Little N. Fk. Clearwater	3	0.1	66	2.4	2	2.5	122	6.7	4	6.9	157	12.2	30	13.5	44	13.8	22	15.8	4	13.9	3	16.1
Adair Creek	5	0.3	26	1.8	2	1.9	46	4.4	2	3.6	64	8.1	12	9.0	27	9.6	15	11.4	2	9.7	8	12.0
Rocky Run Creek	1	0.1	22	2.9			17	5.1	4	5.6	27	8.6	14	10.9	7	9.4	11	13.1				
Rutledge Creek	1	0.07	15	1.1			27	2.8			26	4.6	2	4.7	11	5.3	2	5.6	2	5.4	2	6.8
Montana Creek							1	0.1			3	3.9			3	6.9			2	8.8	1	9.8
Garveson Creek	2	0.2	14	1.7			34	5.4	2	5.6	66	12.6	8	13.6	13	14.0	12	16.4	1	14.1	2	16.7
Renfro Creek	9	0.35	103	4.4	3	4.5	122	9.2	21	10.1	154	15.2	54	16.2	47	17.0	70	22.8	2	17.1		
Davis Creek			2	0.3			2	0.6	1	0.7	7	1.5					1	1.8				
Little Carpenter Creek																						
Total	202	0.26	1,967	2.8	56	2.9	2,779	6.5	273	6.9	4,048	11.8	286	12.6	1,342	13.56	1,311	16.1	78	13.7	195	16.4
Clearwater Operation																						
E. Fk. Clearwater & Branches																						
Moose Creek			2	0.09			3	0.2			4	0.4	2	0.5								
Independence Creek			1	0.04							4	0.2										
Ozier Creek			11	1.4			17	3.6	1	3.7	10	4.8	2	5.2	2	5.1						
Total			14	0.2			20	0.6	1	0.6	16	0.9	4	0.93	2	0.9						

Ribes Data

Drainage	Ribes viscosissimum No.	Per Acre	F.L.S.	Per Acre	Ribes lacustre No.	Per Acre	F.L.S.	Per Acre	Total Ribes No.	Per Acre	F.L.S.	Per Acre
St. Joe Operation												
Stream below Turner Creek					1	.3	2	.3	1	.3	2	.3
Turner Creek	8	2	152	36	10	2	133	32	18	4	285	68
Stream below Bird Creek	52	24	892	415	14	6	188	87	66	31	1,080	502
Bird Creek	4,085	79	65,717	1,273	2,230	43	34,587	670	6,416*	124	103,230	2,000
Stream below Bottle Creek					1	5	6	30	1	5	6	30
Bottle Creek	7	3	145	63	58	25	595	259	65	28	740	322
Malin Creek	387	22	4,810	271	275	16	5,568	286	699*	39	12,408	700
Eagle Creek	4,488	74	62,954	1,041	1,672	28	45,654	755	6,222*	103	110,686	1,830
Quartz Creek	135	1	1,776	20	1,705	19	52,560	577	1,867*	21	54,776	602
Haggerty and Shady Creeks	2	1	30	18	14	8	195	115	16	9	225	132
Tumbledown Creek	10	1	225	14	179	11	3,336	206	190*	12	3,586	221
Bruin Creek	8	1	205	9	148	7	5,246	237	156	7	5,451	246
Gold Creek	400	4	6,953	68	2,059	20	49,444	484	2,459	24	56,397	552
Simmons Creek	787	16	24,377	506	1,317	27	21,324	443	2,104	44	45,701	949
Upper Sisters, Bonehead, Webfoot	327	16	5,985	284	1,121	53	20,152	956	1,448	69	26,137	1,240
Sisters Cr., Hilo to Alpine	453	60	7,206	948	81	11	1,540	203	534	70	8,746	1,151
Hilo Creek												
Bearskull Creek					333	36	11,011	1,190	333	36	11,011	1,190
Alpine Creek					165	58	2,423	858	165	58	2,423	858
W. Fk. Bluff Creek	152	18	2,769	327	857	101	12,231	1,443	1,009	119	15,000	1,770
E. Fk. Bluff Creek	1,059	130	21,839	2,680	660	81	4,703	577	1,719	211	26,542	3,257
Little N. Fk. Clearwater	542	42	11,873	910	1,722	132	33,222	2,546	2,266	174	45,095	3,456
Adair Creek	2	1	12	2	256	38	3,899	573	258	39	3,911	575
Rocky Run Creek	75	13	1,461	249	394	67	3,243	552	469	80	4,704	801
Rutledge Creek	302	32	6,963	729	293	31	2,946	308	595	62	9,909	1,038
Montana Creek	7	1	152	25	96	16	1,365	225	103	17	1,517	250
Garveson Creek	401	119			62	18			463	137		
Renfro Creek	2,076	81			96	4			2,172	85		
Davis Creek	5	2			141	48			146	50		
Little Carpenter Creek												
Total	15,770	29	226,496	411	15,960	29	315,583	573	31,958	56	549,568	998
Clearwater Operation												
E. Fk. Clearwater & Branches												
Moose Creek	1	1	10	1	87	10	1,760	201	88	10	1,760	201
Independence Creek					161	17	2,000	206	161	17	2,000	206
Ozier Creek	192	36	3,240	600	199	37	2,799	518	391	72	6,039	1,118
Total	193	8	3,250	136	447	19	6,549	275	640	27	9,799	411

*Total ribes includes *Ribes irriguum*.
**Number of trees examined not included for drainages where no canker data taken in computing cankers per 100 total trees.

TABLE NO. 3

PINE DISEASE SURVEY, 1937
SUMMARY BY YEARS OF WORKING WORKED AND PARTIALLY WORKED AREAS, ST. JOE OPERATION

Stream Scout

Drainage / Years of Working	Distance Run Mi.	Distance Run Ch.	White Pine No. Exam.	White Pine No. Inf.	White Pine Per Cent	Cankers No.	Cankers Per 100 Trees	Ribes petiolare No.	Ribes petiolare F.L.S.	Ribes visc. No.	Ribes visc. F.L.S.	Ribes lacustre No.	Ribes lacustre F.L.S.	Total No.	Total F.L.S.
Long Meadow and Cvlat Creeks, T. 39-40N R. 1-2E															
Stream 1929 Upland 1931	1		65	30	46.2	86	132.3			3	32	19	1,860	22	1,892
Stream 1929-1930 Upland 1935	19	20	3,028	89	2.9	164	5.4	13		38	111	332	1,722	383	
Stream 1929 Upland Unworked	7	10	299	8	2.7	8	2.7			*		*			
Stream and Upland 1935	6	26	1,478	32	2.2	63	4.3			4	8	55	548	59	603
Unworked	1	65	562	12	2.1	14	2.5			*		*			
Total	35	40	5,432	172	3.1	336	6.2								
East Fork Potlatch Creek, T. 40-41N R. 1-2E															
Stream 1928-1929 Upland 1933	11	15	1,342	111	8.3	295	21.9	16	70	3	8	183	109	201	
Stream 1928-1929 Upland 1934	13	70	1,907	176	9.2	408	21.4	2	100	18	127	139	751	159	978
Stream 1928-1929 Upland 1936															
Stream 1928-1929 Upland Unworked															
Stream and Upland 1933	1		44					39	1,325			21	135	62	1,483
Stream 1933 Upland 1934		35	40									80	590	80	590
Stream 1933 Upland Unworked	2	65	541	2	0.3	2	0.3	2	286	711	6,412	145	964	858	7,562
Stream and Upland 1934	6	30	170	6	3.5	6	3.5	41		79	850	13	33	138	
Total	34	50	4,044	295	7.3	711	17.5								
Ruby Creek, T. 40N R. 1E															
Stream and Upland 1933	1	65	697	88	12.6	292	41.8			15	47	28	73	43	120
Stream 1933 Upland 1935	1	16	236	31	13.1	48	20.3			6	37	6	33	12	70
Stream 1933 Upland Unworked	1	56	73							15	360	9	36	24	396
Unworked	1	35	247	26	10.5	32	12.9	1	8	11	69	9	90	21	167
Total	6	10	1,280	145	11.3	372	29.0								
Cameron, Squaw, Shattuck and Lindley Creeks, T.40N R.2E															
Stream 1930 Upland 1933	17	73	1,494	21	1.4	27	1.8	55		161		42		258	
Stream 1930 Upland 1934	4	50	701	2	4.0	126	17.9			13		30		43	
Stream 1930 Upland 1935	1	40	175							3		8		11	
Stream 1930 Upland 1936	2	60	91	2	2.2	2	2.2			4		47		51	
Total	26	63	2,461	51	2.0	155	6.3	55		181		127		363	
Elk Creek, T. 40N R. 2E															
Stream 1930-1931 Upland 1933	4	40	1,096	45	4.1	160	14.6	1		1		18		21	
Stream 1930 Upland 1934		70	235	4	1.7	9	3.8	6		6		20		32	
Stream 1930 Upland 1936		30	267	32	11.9	48	17.9	1	75	12		13		26	
Stream 1930 Upland Unworked	3	7	874	36	4.1	80	9.1	2		*		88			
Total	8	67	2,471	117	4.7	297	12.0								
Partridge Creek, T. 40N R. 2-3E															
Stream 1930 Upland 1934	3	68	1,098	59	5.3	74	6.7	1		1		12		14	
Stream 1930 Upland 1935															
Stream 1930 Upland 1936		20	163	11	6.7	14	8.5			1		4		5	
Stream 1930 Upland Unworked	11	40	2,831	409	14.4	926	32.7	2		*		115			
Total	15	48	4,092	479	11.7	1,014	24.7	3							
Deep and Gold Creeks, T. 39-40N R. 2-3E															
Stream 1929 Upland 1935															
Stream 1929 Upland 1936	11	12	1,025	177	17.2	531	51.8	1		8		19		27	
Stream 1929 Upland Unworked															
Total	11	12	1,025	177	17.2	531	51.8								
Elk and Cedar Creeks, T. 38-39N R. 2E															
Stream 1930 Upland 1936	2	60	1,554	530	34.1	1,543	105.7			27	202	14	122	41	324
Stream 1930 Upland Unworked	5	5	2,131	441	20.7	1,229	57.7			79	886	2	36	87	1,020
Total	7	65	3,685	971	26.4	2,872	77.9								
Headwaters Potlatch Creek and East Fork St. Maries River, T. 41-42N R. 1W-1E															
Stream and Upland 1934															
Stream and Upland 1933	11	4	1,695	45	2.6	136	8.0	50	1,650	54		155		259	
Total	11	4	1,695	45	2.6	136	8.0	50	1,650	54		155		259	
Maple Creek, T. 42N R. 1E															
Stream and Upland 1933	2	72	1,141	131	11.4	508	44.5	1		27		34		62	
East Fork Emerald Creek, T.42N R. 1W-1E															
Stream and Upland 1933															
Stream and Upland 1935															
Stream and Upland 1936		71	534	15	2.8	22	4.1					3		3	
Unworked	3	18	2,158	57	2.6	80	3.7			*		*			
Total	4	9	2,692	72	2.7	102	3.8								
Gold Center Creek, T. 42N R. 3E															
Stream and Upland 1933															
Stream and Upland 1934															
Unworked															
Total															
Grand Total	164	40	30,018	2,655	8.8	7,334	24.4								

Upland Strips — Number of Trees Infected (New) and Reinfected (Previous) by Years

Drainage / Years of Working	Distance Run Mi.	Distance Run Ch.	White Pine No. Exam.	White Pine No. Inf.	White Pine Per Cent	Cankers No.	Cankers Per 100 Trees	Up to 1928 No.	Up to 1928 Per Cent	1929-1930 New	1929-1930 Per Cent	1929-1930 Prev.	1929-1930 Per Cent	1931 New	1931 Per Cent	1931 Prev.	1931 Per Cent	1932 New	1932 Per Cent	1932 Prev.	1932 Per Cent	1933 New	1933 Per Cent	1933 Prev.	1933 Per Cent	1934 New	1934 Per Cent	1934 Prev.	1934 Per Cent
Long Meadow and Cvlat Creeks, T. 39-40N R. 1-2E																													
Stream 1929 Upland 1931	4	62	603	167	27.7	382	63.3	36	5.9	23	9.8	8	11.1	26	14.1	13	17.6	58	23.7	9	28.7	21	27.2	7	33.3	3	27.7		
Stream 1929-1930 Upland 1935	20	5	4,129	138	3.3	437	10.5			9	.21			22	.75			52	2.0	3	3.7	52	3.2	7	3.6	3	3.3	1	
Stream 1929 Upland Unworked	4	75	584	44	7.5	84	14.4	9	1.5	9	3.1	2	3.4	11	5.0	2	5.6	11	6.8	5	6.4	3	7.4	2	9.2	1	7.6	3	9.9
Stream and Upland 1935	5	12	2,022	69	3.4	133	6.6	4	0.2	18	1.1	2	1.2	23	2.2	3	2.6	21	3.2	2	3.6	3	3.4	5	4.0				
Unworked		73	253	8	3.2	11	4.3			3	1.2			4	2.8			1	3.5	1	3.5								
Total	35	67	7,591	426	5.8	1,047	14.2	49	0.7	62	1.5	12	1.7	86	2.7	18	3.1	143	4.6	20	5.3	79	5.7	21	6.7	7	5.8	4	6.8
East Fork Potlatch Creek, T. 40-41N R. 1-2E																													
Stream 1928-1929 Upland 1933	12	15	730	60	8.2	179	24.5	1	0.1	4	0.7			16	2.9			30	6.9	1	7.1	6	8.6	6	7.8	2	8.2	1	9.0
Stream 1928-1929 Upland 1934	8	79	2,207	121	5.1	240	10.9	4	0.2	29	1.5			30	2.8	1	2.9	39	4.6	4	4.8	10	5.1	5	5.5				
Stream 1928-1929 Upland 1936	1	5	154	8	5.2	9	5.8			4	2.6			3	4.5			1	5.2										
Stream 1928-1929 Upland Unworked		70																											
Stream and Upland 1933		7	20	4	20.0	4	20.0							3	15.0			1	20.0										
Stream 1933 Upland 1934		70	206	2	1.0	2	1.0			1	0.5			1	1.0														
Stream 1933 Upland Unworked	4	40	302	1	0.3	1	0.3			1	0.3																		
Stream and Upland 1934		50	31																										
Total	29	15	3,650	187	5.1	435	11.9	5	0.1	39	1.2			53	2.7	1	2.8	71	4.6	5	4.8	16	5.0	11		2		1	
Ruby Creek, T. 40N R. 1E																													
Stream and Upland 1933	1	45	184	31	16.8	76	41.3	4	2.1	1	2.7	1	7.0	7	6.5	4	16.8	14	14.1			6	16.8						
Stream 1933 Upland 1935		25	6																										
Stream 1933 Upland Unworked	2	5	29																										
Unworked		65	100	6	6.0	8	8.0							1	1.0			3	4.0			2	6.0						
Total	4	60	319	37	11.5	84	26.3	4	1.2	1	1.5	1		8	4.0	4		17	9.4			7	11.5						
Cameron, Squaw, Shattuck and Lindley Creeks, T.40N R.2E																													
Stream 1930 Upland 1933	10	65	1,219	16	1.3	53	4.2								No years of infection														
Stream 1930 Upland 1934	6	30	2,255	19	.8	76	3.4			7	0.3			5	0.5			5	0.7	2	0.8	2	0.8	2	1.0			1	1.0
Stream 1930 Upland 1935																													
Stream 1930 Upland 1936	1		66																										
Total	18	15	3,540	35	.98	129	3.6			7				5				5		2		2		2				1	
Elk Creek, T. 40N R. 2E																													
Stream 1930-1931 Upland 1933																													
Stream 1930 Upland 1934	1	45	297	7	2.3	22	7.4			1	0.3			3	1.3			3	2.3										
Stream 1930 Upland 1936																													
Stream 1930 Upland Unworked		47	162	4	2.4	5	3.0											3	1.8			1	2.4						
Total	2	12	459	11	2.3	27	5.8			1	0.2			3	0.8			6	2.1			1	2.3						
Partridge Creek, T. 40N R. 2-3E																													
Stream 1930 Upland 1934		25	60																										
Stream 1930 Upland 1935		70	124	2	1.6	3	2.4											2	1.6										
Stream 1930 Upland 1936																													
Stream 1930 Upland Unworked	2	65	294	20	6.8	27	9.1			4	1.3			9	4.4			4	5.7			3	6.8	1	7.1				
Total	4	1	478	22	4.6	30	6.2			4	0.83			9	2.9			6	3.9			3	4.6	1	4.8				
Deep and Gold Creeks, T. 39-40N R. 2-3E																													
Stream 1929 Upland 1935		55	56	9	16.0	22	39.2	1	1.7	1	3.5			5	12.5			2	16.0	1				1	19.5				
Stream 1929 Upland 1936	3	66	365	108	29.5	581	159.1	3	0.8	13	4.38	2	4.9	32	13.1	3		39	23.8	10		19	29.0	26		2	29.5	6	
Stream 1929 Upland Unworked	1	5	203	5	2.4	52	25.6			2	0.9			2	1.9	1	2.4	1	2.4					1	3.4				
Total	5	46	624	122	19.5	655	104.9	4	0.64	16	3.2	2	9.7	39	9.4	4	17.1	42	16.1	11	21.9	19	19.2	28	26.7	2	19.5	6	27.7
Elk and Cedar Creeks, T. 38-39N R. 2E																													
Stream 1930 Upland 1936		35	858	441	51.4	2,321	270.5	16	1.9	97	13.2	2	13.4	133	28.7	32	32.8	122	42.9	65	54.4	58	49.6	96	72.4	14	51.3	42	78.9
Stream 1930 Upland Unworked		36	639	149	23.3	439	68.7	6	0.9	21	4.2	3	4.7	23	7.8	1	8.4	32	12.8	10	15.0	46	20.0	7	23.3	21	23.3	15	28.9
Total		71	1,497	590	39.4	2,760	184.4	22	1.5	118	9.3	5	9.7	156	19.8	33	22.3	154	30.1	75	37.6	104	37.0	103	51.4	35	39.3	57	57.6
Headwaters Potlatch Creek and East Fork St. Maries River, T. 41-42N R. 1W-1E																													
Stream and Upland 1934	1	60	796	6	.75	6	.75											3				3							
Stream and Upland 1933	11	21	1,735	24	1.4	194	11.2										No years of infection												
Total	13	1	2,531	30	1.2	200	7.9											3				3							
Maple Creek, T. 42N R. 1E																													
Stream and Upland 1933	3	13	1,886	247	13.0	623	33.0	16	0.8	33	2.5	1	2.6	73	6.4	7	6.8	70	10.1	9	12.0	24	11.4	17	14.2				
East Fork Emerald Creek, T.42N R. 1W-1E																													
Stream and Upland 1933	2	60	386	18	4.7	41	10.6	1	0.2	4	1.3			7	3.1			2	3.6	1	3.9	4	4.7	2	5.4				
Stream and Upland 1935	2	28	1,508	249	16.5	641	42.5	7	0.5	52	3.9	1	4.0	70	8.5	6	7.0	77	13.7	20	15.4	38	16.2	34	18.4	5	16.5	3	18.9
Stream and Upland 1936	4	54	2,562	403	15.7	1,077	42.0	21	0.8	76	3.8	5	3.9	105	7.9	4	8.2	124	12.7	26	14.1	64	15.2	49	18.5	13	15.7	15	19.6
Unworked	3	16	3,406	177	5.2	385	11.3	2	0.1	36	1.1			49	2.6	6	2.7	65	4.3	17	5.1	22	5.1	18	6.3	3	5.2	5	6.5
Total	12	78	7,882	847	10.8	2,144	27.3	31	0.4	168	2.5	6	2.6	231	5.5	16	5.7	268	8.9	64	9.9	128	10.5	103	12.9	21	10.8	23	13.5
Gold Center Creek, T. 42N R. 3E																													
Stream and Upland 1933		29	1,191	559	46.9	3,200	268.6	39	3.2	135	14.6	5	15.0	152	27.3	22	27.9	150	39.9	90	49.7	80	46.5	126	67.0	3	46.9	18	68.7
Stream and Upland 1934		60	520	178	34.2	867	128.2	12	2.3	41	10.1	5	11.1	27	15.3	8	17.5	69	28.6	23	35.1	28	34.0	27	45.7	1	34.2	8	47.5
Unworked		60	251	108	43.0	414	164.9	5	1.9	13	7.17	1	7.5	27	17.9	5	20.3	35	31.8	6	36.6	25	41.8	20	54.5	3	43.0	6	58.1
Total	1	69	1,962	845	43.0	4,281	218.1	56	2.8	189	12.4	11	13.0	206	22.9	33	25.2	254	35.9	119	44.2	133	42.7	172	59.7	7	43.0	32	61.7
Grand Total	131	48	32,399	3,399	10.5	12,415	38.3																						

Upland Strips — Ribes Data

Drainage / Years of Working	Ribes petiolare No.	Ribes petiolare F.L.S.	Ribes viscosissimum No.	Ribes viscosissimum Per Acre	Ribes viscosissimum F.L.S.	Ribes viscosissimum Per Acre	Ribes lacustre No.	Ribes lacustre Per Acre	Ribes lacustre F.L.S.	Ribes lacustre Per Acre	Total Ribes No.	Total Ribes Per Acre	Total Ribes F.L.S.	Total Ribes Per Acre
Long Meadow and Cvlat Creeks, T. 39-40N R. 1-2E														
Stream 1929 Upland 1931			18	2	179	19	20	2	222	23	38	4	401	42
Stream 1929-1930 Upland 1935	1		156	4	665	16	133	3	1,698	40	289	7	2,253	66
Stream 1929 Upland Unworked			291	29	1,073	109	27	3	133	13	321	32	1,506	122
Stream and Upland 1935			53	5	444	43	21	2	243	24	74	7	687	67
Unworked			142	76	342	182	4	2	58	31	146	78	400	213
Total	1													
East Fork Potlatch Creek, T. 40-41N R. 1-2E														
Stream 1928-1929 Upland 1933	9	83	816	33	**		210	9	**		1,026	42	**	
Stream 1928-1929 Upland 1934	1	5	135	7	1,313	73	148	8	1,003	56	283	15	2,316	129
Stream 1928-1929 Upland 1936			5	2	13	6					5	2.4	13	6
Stream 1928-1929 Upland Unworked			5	3	**						5	2.8	**	
Stream and Upland 1933	6	145	5	3	23	131	3	17	14	80	8	45	37	211
Stream 1933 Upland 1934			5	3	26	15	7	4	43	25	12	6.8	69	40
Stream 1933 Upland Unworked	2	3	212	24	3,196	355	72	8	1,078	120	284	32	4,274	475
Stream and Upland 1934														
Total														
Ruby Creek, T. 40N R. 1E														
Stream and Upland 1933			21		181	58	36	16	220	71	67	18	401	129
Stream 1933 Upland 1935			1	1	1	1					1	1	1	1
Stream 1933 Upland Unworked			4	1	23	6	1		1		5	1	24	6
Unworked			7	4	56	34	8	5	62	38	16	9	118	72
Total														
Cameron, Squaw, Shattuck and Lindley Creeks, T.40N R.2E														
Stream 1930 Upland 1933	7	91	46	2	230	11	11	1	58	3	57	3	288	14
Stream 1930 Upland 1934	3	64	33	3	223	18	99	8	422	33	132	11	645	51
Stream 1930 Upland 1935														
Stream 1930 Upland 1936			42	21			37	18			79	39		
Total	10	145	121	3	453	12	147	4	480	13.2	268	7	933	25.6
Elk Creek, T. 40N R. 2E														
Stream 1930-1931 Upland 1933														
Stream 1930 Upland 1934			47	15	261	84	2	1	2	0.64	49	16	263	84.1
Stream 1930 Upland 1936														
Stream 1930 Upland Unworked			110	94			9	8			119	102		
Total														
Partridge Creek, T. 40N R. 2-3E														
Stream 1930 Upland 1934			2	3							2	3		
Stream 1930 Upland 1935			3	2							3	2		
Stream 1930 Upland 1936														
Stream 1930 Upland Unworked			*											
Total														
Deep and Gold Creeks, T. 39-40N R. 2-3E														
Stream 1929 Upland 1935			8	6							8	6		
Stream 1929 Upland 1936			43	6			55	7			98	13		
Stream 1929 Upland Unworked			210	99							210	99		
Total														
Elk and Cedar Creeks, T. 38-39N R. 2E														
Stream 1930 Upland 1936			4	4	23	26	1		25	29	5	5	48	55
Stream 1930 Upland Unworked			62	69	552	613					62	69	562	613
Total														
Headwaters Potlatch Creek and East Fork St. Maries River, T. 41-42N R. 1W-1E														
Stream and Upland 1934							7	2	11	3	7	2	11	3
Stream and Upland 1933	5	23	85	4			20	1	329	15	105	5	329	15
Total	5	23	85	3			27	1	340	13	112	4	340	13
Maple Creek, T. 42N R. 1E														
Stream and Upland 1933	1		51	8			23	4			74	11		
East Fork Emerald Creek, T.42N R. 1W-1E														
Stream and Upland 1933	16						30	5			30	5		
Stream and Upland 1935			15	3			32	7			47	10		
Stream and Upland 1936			333	35			279	30			612	65		
Unworked			*				*							
Total														
Gold Center Creek, T. 42N R. 3E														
Stream and Upland 1933	4						21	29			21	29		
Stream and Upland 1934			36	24			6	4			42	28		
Unworked			282	188			14	9			296	197		
Total														
Grand Total														

* No total for ribes and feet of live stem. In unworked areas ribes shown as "heavy" in transects where there were too many bushes for rapid count or accurate estimate of live stem.
** No live stem given as seedlings included in number of ribes.

TABLE NO. 4

PINE DISEASE SURVEY, 1937

EFFECTIVENESS OF CONTROL STUDIES, ST. JOE AND CLEARWATER OPERATIONS

Drainage: Years of Ribes Eradication	Strip Location	Distance Run Mi.	Distance Run Ch.	White Pine No. Exam.	White Pine No. Inf.	White Pine Per Cent	Cankers No.	Cankers Per 100 Trees	Up to 1928 No.	Up to 1928 Per Cent	1929-1930 New	1929-1930 Per Cent	1929-1930 Prev.	1929-1930 Per Cent	1931 New	1931 Per Cent	1931 Prev.	1931 Per Cent	1932 New	1932 Per Cent	1932 Prev.	1932 Per Cent	1933 New	1933 Per Cent	1933 Prev.	1933 Per Cent	1934 New	1934 Per Cent	1934 Prev.	1934 Per Cent	1935 New	1935 Per Cent	1935 Prev.	1935 Per Cent	Ribes petiolare No.	Ribes petiolare F.L.S.	Ribes viscosissimum No.	Ribes viscosissimum Per Acre	Ribes viscosissimum F.L.S.	Ribes viscosissimum Per Acre	Ribes lacustre No.	Ribes lacustre Per Acre	Ribes lacustre F.L.S.	Ribes lacustre Per Acre	Total Upland Ribes No.	Total Upland Ribes Per Acre	Total Upland Ribes F.L.S.	Total Upland Ribes Per Acre
St. Joe Operation																																																
West Fork St. Maries River, T. 42N R. 1E																																																
Stream and	Stream	15	30	2,026	138	6.8	502	24.8	10	.5	31	2.0	3	2.2	33	3.7	4	4.0	53	6.3	14	7.3	10	6.8	12	8.4	1	6.8	1	8.9					228	1,865	1		6		67		736		68		742	
Upland 1933	Upland	12	58	3,458	129	3.7	316	9.1	7	0.2	33	1.2			47	2.5	6	2.7	35	3.5	8	3.9	7	3.7	3	4.5			1	4.25			1	4.28			8	1	77	3	7	1	21	1	15	1	98	4
Stream and	Stream	5	40	1,543	120	7.8	297	19.2	4	0.3	27	2.0			37	4.4	1	4.5	47	7.5	8	8.0	5	7.8	9	8.9															4		14		4		14	
Upland 1934	Upland	5	68	1,916	18	0.9	26	1.4			4	0.2			6	0.5			8	0.9	2	1.0															4	1	22	2	1	1	7	1	5	1	29	2
Stream and	Stream	1	20	315	1	0.3	1	0.3											1	0.3																					2		5		2		5	
Upland 1935	Upland	1	15	427	1	0.2	1	0.2							1	0.2																					2	1	15	6					2	1	15	6
Stream and	Stream	1		387	1	0.3	1	0.3															1	0.3													1		2		1		5		2		7	
Upland 1936	Upland	1		167																																												
Unworked	Stream	16	36	1,958	75	3.8	534	27.3	1	0.05	27	1.4	1	1.6	22	2.6	6	2.9	19	3.5	20	4.9	5	3.8	12	5.8	1	3.8	3	6.2					29	385	274		4,494		460		8,959		775		13,985	
	Upland	4		1,156	13	1.1	26	2.2			2	0.2			4	0.5			6	1.0	1	1.1	1	1.1													215	27	4,399	549.9	20	2	435	54.3	235	29	4,834	604
Total	Stream	39	46	6,230	335	5.4	1,335	21.4	15	0.2	55	1.6	4	1.7	92	3.1	11	3.3	120	5.0	42	5.9	21	5.3	33	6.8	2	5.4	4	6.9					257	2,250	276		4,502		534		9,719		1,079		16,618	
	Upland	24	61	7,124	161	2.3	369	5.2	7	0.1	39	0.6			58	1.4	6	1.5	49	2.1	11	2.4	8	2.3	3	2.5			1	2.5			1	2.6			229	5	4,513	91	28	1	463	9	257	5	4,976	100
Little East Fork Emerald Creek, T. 42N R. 1E																																																
Stream and	Stream	3	25	1,958	274	14.0	1,002	51.2	4	0.2	26	1.5	2	1.6	57	4.4	3	4.6	77	8.3	17	9.2	93	13.1	32	15.8	16	13.8	24	17.9	1	13.9	2	16.1	3	25					13		48		16		73	
Upland 1935	Upland	2	10	387	29	7.5	45	11.6			4	1.0			12	4.1			9	6.4			4	7.5					1	7.7							2	1	8	2					2	1	8	2
Stream and	Stream	1	35	226	50	22.1	131	57.9			2	0.8			11	5.7			23	15.9			13	21.6	5	19.4	1	22.1	4	26.1											1		3		1		3	
Upland 1936	Upland	2	50	404	13	3.2	17	4.1			1	0.2			3	1.0			7	2.7			2	3.2													1	1	2	1	1		4	1	2	1	6	1
Total	Stream	4	60	2,184	324	14.8	1,133	51.8	4	0.1	28	1.4	2	1.5	68	4.5	3	4.8	100	9.1	17	10.1	106	14.0	37	16.7	17	14.7	28	18.7	1	14.8	2	18.9	3	25					14		51		14		51	
	Upland	4	60	791	42	5.3	62	7.8			5	0.6			15	2.5			16	4.6			6	5.3					1	5.4							3	1	10	1	1		4		4	1	14	1
Clearwater Operation																																																
Weitas Creek, T. 37-38N R. 8E																																																
Stream and Upland 1931	Stream		40	340	61	17.9	97	28.5			1	0.2			9	2.9			29	11.4			22	17.9													1		60		5		76		6		136	
Stream 1931 Upland Unworked	Upland	2	25	638	115	18.0	202	31.7	2	0.3	13	2.4			40	8.6	4	9.2	48	16.1			10	17.7	1	18.5	2	18.0							1	20	23	5	644	139	31	7	604	131	54	12	1,248	270
Stream and	Stream	1	5	340	49	14.4	68	20.0			10	2.9			14	7.0			20	12.9	3	13.8	5	14.8	1	15.5															4		11		4		11	
Upland 1932	Upland	2	75	1,561	291	18.6	425	27.23	8	0.5	54	4.0	3	4.2	89	9.7			124	17.6	8	18.3	15	18.6	2	19.4	1	18.6									438	75	2,652	457	7	1	51	9	445	76	2,733	465
Stream 1932 Upland 1934	Stream		60	164	26	15.8	44	26.8			2	1.2			2	2.4			17	12.8			5	15.8											1	500					10		30		10		30	
Stream 1932-1933	Stream		70	249	140	56.2	259	104.0	4	1.6	32	14.5	1	14.9	42	21.3	2	32.5	61	55.8	13	62.3	1	56.2	2	63.4											5		10		1		3		6		13	
Upland Unworked	Upland	1	65	884	269	30.4	519	58.7	14	1.6	51	7.4	1	7.5	99	18.5	4	19.1	83	27.9	5	29.1	16	29.8	5	31.5	5	30.3	1	32.1	1	30.4			2	85	59	16	1,216	335	36	10	563	155	95	26	1,779	491
Stream and	Stream	1	35	223	75	33.6	161	72.2			22	9.9			16	17.0	1	17.5	32	31.4	5	34.1	4	33.2	4	37.7	1	33.6	1	38.1					4	1,562	130		2,442		33		3,074		163		5,536	
Upland 1934	Upland	2	72	2,151	346	16.1	537	25.0	3	0.1	80	3.9	1	3.9	149	10.8	1	10.9	105	15.7	5	16.0	9	16.1	3	16.5			1	16.6							221	38	3,524	608	25	4	167	29	246	42	3,691	636
Unworked	Stream	13	15	3,042	977	32.1	3,326	109.3	15	0.5	119	4.4	2	4.5	184	10.4	11	10.9	364	22.4	23	23.5	199	29.0	35	31.3	88	31.9	76	36.7	8	32.1	44	38.4	55	33,786	513		10,811		385		26,139		898		36,949	
	Upland	6	8	2,562	290	11.3	633	24.7	5	0.2	73	3.0			80	6.2	5	6.1	101	10.1	12	10.8	29	11.2	9	12.3	2	11.3	2	12.4			1	12.5	4	900	899	73	18,947	1,553	19	2	1,048	86	908	74	19,995	1,639
Total	Stream	17	65	4,358	1,328	30.5	3,955	90.8	19	0.4	186	4.7	3	4.8	267	10.8	14	11.2	523	22.8	44	24.2	236	28.2	42	30.6	89	30.3	77	34.4	8	30.5	44	35.6	60	35,843	649		13,343		435		29,232		1,087		42,675	
	Upland	16	5	7,796	1,311	16.8	2,316	29.7	32	0.4	271	3.9	2	3.9	457	9.7	17	10.0	161	15.7	30	16.3	79	16.7	20	17.6	10	16.8	4	17.7	1	16.8	1	17.8	7	1,005	1,630	51	27,213	841	118	4	2,433	76	1,748	54	29,446	917
Reeds and Alder Creeks, T. 38N R. 5E																																																
Stream 1929 and 1931	Stream	16	75	3,636	217	6.0	428	11.8	6	0.2	21	0.1			45	2.0	3	2.1	84	4.3	9	4.5	51	5.7	11	6.3	9	5.9	5	6.7	1	6.0	2	6.8	214	4,572	5		25		164		2,525		383		7,122	
Upland 1932	Upland	6	60	1,323	48	3.6	72	5.4	1	0.1	3	0.3			19	1.7	1	1.8	15	2.9			5	3.2	1	3.4	3	3.5			2	3.6			1	6	45	3	1,083	80	27	2	383	28	73	5	1,466	109
Stream 1930	Stream	6	46	759	21	2.8	49	6.4	2	0.3	5	0.9	1	1.0	3	1.3	1	1.6	7	2.2	2	2.8	1	2.4	2	3.2	3	2.8							37	1,925	6		119		54		352		97		2,396	
Upland 1932	Upland	1	20	51																																												
Stream 1929 and 1931	Stream	20	13	1,774	120	6.8	375	21.1	7	0.3	25	1.8	1	1.9	23	3.1	6	3.4	36	5.1	16	6.4	21	6.3	12	8.2	3	6.6	9	8.9	5	6.8	2	9.3	371	5,572	171		940		95		965		637		7,477	
Upland 1933	Upland	5	60	735	55	7.5	72	9.8			1	0.1			19	2.7			29	6.7			2	6.9	1	7.1	4	7.5	1	7.7			1	7.9			125	11	1,003	87	3	1	23	2.0	129	11	1,026	89
	Along railroad	1		2,071	114	5.5	137	6.6			8	0.4			51	2.8			49	5.2			6	5.5					2	5.6			1	5.6	2	17	2	1	24	12	2	1	7	3.5	4	2	31	15.5
Stream 1930	Stream	9	50	998	121	12.1	783	78.4	4	0.4	31	3.5			21	5.6	8	6.4	44	10.0	19	12.7	16	11.6	16	15.9	5	12.1	12	17.6					138	8,220					37		272		175		8,492	
Upland 1933	Upland	3	43	609	83	13.6	395	64.8	12	2.0	18	4.9	1		30	9.8	5	10.8	20	13.1	8	15.4	2	13.5	12	17.7	1	13.6	3	18.4					1	20	3	0.42	30	4.24					3	1	30	4
Stream and	Stream		34	39	1	2.6	1	2.6			1	2.6																													1		60		1		60	
Upland 1933	Upland	1	25	98																																	1	1	9	3					1		9	
Stream 1929 and 1931	Stream	7	72	470	68	14.5	133	28.3	1	0.2	9	2.1			8	3.8			24	8.9	4	9.8	17	12.5	4	14.2	7	14.0	6	17.0	2	14.5			31	678	8		61		31		153		73		892	
Upland 1934	Upland	3	15	105																																	14	2	51	8	1	1	20	3	15	2	71	11
	Along railroad	2	20	5,507	1,490	27.0	2,677	48.6			27	0.5			216	4.4	3	4.5	504	13.6	12	13.8	455	22.0	63	23.0	242	26.4	75	29.2	36	27.0	22	30.2	78	2,233	56	12	1,562	347	144	32	3,635	808	200	44.4	5,197	1,155
Stream 1929 and 1931	Stream		65	67	3	4.5	4	6.0											2	3.0			1	4.6											19	217	266		2,516		16		83		301		2,916	
Upland 1935	Upland		60	565	20	3.5	45	6.8	1	0.2	4	0.9			5	1.8			6	2.8	2	3.2	3	3.4	4	4.4	1	3.5	1	4.8							123	84	417	278					123	84	417	278
Total	Stream	61	35	7,743	551	7.1	1,773	22.9	20	0.2	92	1.4	2	1.5	100	2.7	17	3.0	197	5.3	50	6.2	107	6.66	45	9.1	27	7.0	32	8.9	8	7.1	4	9.05	813	21,184	456		3,661		398		4,410		1,667		29,255	
	Upland	25	60	11,064	1,810	16.3	3,398	30.7	14	0.1	61	0.7	1	0.7	340	3.7	9	3.8	623	9.4	22	9.7	483	13.74	81	14.8	251	16.0	82	17.8	38	16.3	24	18.3	82	2,276	371	7	4,179	81	177	3	4,068	79	548	11	8,247	160
Orofino and Quartz Creeks, T. 36-37N R. 5E																																																
Stream 1930 Upland 1933	Stream	2	20	555	11	2.0	11	2.0			1	0.2			3	0.7			4	1.4			2	1.8			1	2.0							4	92	27		232		17		111		44		343	
Stream 1930, Upland	Stream	1	70	295	6	2.0	7	2.4			2	0.7			1	1.01			1	1.3			1	1.69			1	2.0	1	2.4					1	100					2		32		2		33	
1933. Rework 1936	Upland		24	21																																												
Stream 1930 Upland 1934	Stream	2	30	354	76	21.5	147	41.5	2	0.6	3	1.4			10	4.2			30	12.7	6	14.4	10	15.53	2	17.8	16	20.0	2	22.9	5	21.5	3	25.1	24	4,630	18		116		14		124		32		240	
Stream 1930	Stream	5	20	260	32	12.3	108	41.5	2	0.8	7	3.5			5	5.5			17	11.9	7	14.6	1	12.3	1	15.4									24	3,393					60		147		60		147	
Upland 1936	Upland	1	65	279	5	1.8	5	1.8							1	0.3			2	1.0			2	1.79																	1		10	3	1	1	10	3
Stream 1931	Stream	1	45	856	30	3.5	65	7.5	3	0.3	5	0.9			4	1.4			16	3.3	5	3.8	2	3.5	3	4.8			3	5.4					2	10					7		318		7		318	
Upland 1933	Upland		40	411	5	1.2	5	1.2											4	1.0			1	1.21																	4	4	12	12	4	4	12	12
Stream 1931, Upland 1933, Rework 1936	Stream	1	15	1,340	7	0.5	7	0.5							2	0.1			5	0.5																					3		12		3		12	
Stream 1932	Stream	8	40	3,317	164	4.9	320	9.6	9	0.3	21	0.9	2	1.0	49	2.4	5	2.6	68	4.4	11	5.0	11	4.76	8	5.5	6	4.9	4	5.8			1	5.9	89	1,682					14		167		14		157	
Upland 1933	Upland	7	11	2,253	32	1.4	41	1.8			4	0.2			16	0.9			10	1.3			1	1.38	1	1.4					1	1.4			6	66	46	3	172	12	3		6		49	3	178	12
Stream 1932, Upland	Stream	4	70	6,439	67	1.0	499	7.7	2	0.03	5	0.07			9	0.2	1	0.3	17	0.5	1	0.5	12	0.7	1	0.8	8	0.8	9	1.0	14	1.0	9	1.2	44	1,720	9		95		26		334		35		429	
1933, Rework 1936	Upland	5	40	2,994	31	1.0	162	5.9			1	0.3			11	0.4			4	0.5			2	0.6			4	0.7	1	0.8	8	1.0	2	1.1	10	209	24	2	149	14	3	1	27	2	27	2	176	16
Stream and	Stream	5		343	85	24.8	488	142.3	7	2.04	5	3.4	1	3.7	9	6.1	1	6.7	24	13.1	5	15.1	32	22.4	20	30.2	8	24.7	20	38.4			6	40.2	63	1,812	1		10		4		24		5		34	
Upland 1935	Upland	2	15	212	5	2.3	5	2.3			2	0.9			1	1.4			2	2.3																												
Stream and	Stream	7	10	1,374	254	18.5	1,097	79.8	4	0.3	17	1.5	1	1.6	61	5.9	3	6.2	110	13.9	15	15.3	45	17.2	31	20.8	13	18.1	14	22.8	4	18.4	6	23.5	82	8,469	3		50		2		12		5		62	
Upland 1936	Upland	5	55	734	117	15.9	1,276	173.8	4	0.5	15	2.6			23	5.7	6	6.5	43	12.4	12	14.8	15	14.57	22	20.0	9	15.8	26	24.8	1	15.9	11	26.4	1	30	3	1	21	2	3		54	5	6	1	75	7
Total	Stream	40		15,129	732	4.8	2,749	18.2	29	0.2	66	0.6	4	0.6	53	1.6	10	1.7	292	3.6	50	4.0	115	4.34	66	5.2	53	4.7	53	5.9	23	4.8	25	6.2	333	21,808	58		503		149		1,272		207		1,775	
	Upland	23	10	6,904	195	2.8	1,494	21.6	4	0.06	22	0.4			52	1.1	6	1.2	71	2.2	12	2.4	22	2.48	23	3.1	13	2.7	28	3.7	10	2.8	13	4.0	17	305	73	2	342	7	14	1	109	2	87	2	451	10

TABLE NO. 5

PINE DISEASE SURVEY, 1937
SUMMARY OF STREAM SCOUT, KANIKSU AND COEUR D'ALENE NATIONAL FORESTS

T.	R.	Drainage	Year of Work	Distance Run Mi.	Distance Run Ch.	White Pine No. Exam.	White Pine No. Inf.	White Pine Per Cent	Cankers No.	Cankers Per 100 Trees	Ribes Data: Ribes viscosissimum No.	Ribes viscosissimum F.L.S.	Ribes lacustre No.	Ribes lacustre F.L.S.	Ribes inerme No.	Ribes irriguum No.	Total Ribes No.	Total Ribes F.L.S.
						Kaniksu National Forest												
34-35N	45-46E	Solo, Galena and	1934	16	51	1,065	6	0.6	93	9.0			No ribes data					
		Klahowya Creeks	Unworked		75	1,866	10	0.5	10	0.5								
			Total	17	46	2,931	16	0.5	103	3.5								
57-58N	1-2E	Treetle Creek	1935	3	76	1,343							No ribes data					
			Unworked	3	35	822	1	0.1	1	0.1								
			Total	7	30	2,165	1	0.04	1	0.04								
56-68N	2-3E	Lightning Creek	1935	12	35	702	2	0.3	4	0.5			No ribes data					
			Unworked	30	40	2,173	2	0.9	2	0.1			27	2,740			27	2,740
			Total	42	75	2,876	4	0.2	6	0.2			27	2,740			27	2,740
		Grand Total		67	71	7,971	21	0.02	110	1.4								
						Coeur d'Alene National Forest												
53N	3E	Jordan, Alder, and	1935	3	20	3,471					1		338		1		339	
		Falls Creeks	1936	2	40	1,159	1		1				25				25	
			Total	5	60	4,630	1		1		1		363		1		364	
62-53N	1-2W	Sob, Tom Lavin,	1933	6	73	808					17	62	100	494			117	556
		Honey, Solitaire,	27, 28 Reworked 34		63	13												
		and Pyrite Creeks	1934	7	35	595					3	40	89	378			92	418
			Total	15	11	1,416					20	102	189	872			209	974
62-53N	1W	Independence Creek	1935	5	50	4,153	1		1				60				60	
	1-2E		Unworked	7	40	1,466					1		430				431	
			Total	13	10	5,619	1		1		1		490				491	
62N	1E	Callis Creek	Unworked	2	30	1,700							509		3		509	
52N	1W	Iron Creek	1934	1	56	60												
52N	2W	Lewelling,Hamberg Cr.	Unworked	2	65	248					8	120	46	464			54	584
62N	2W	Hudlow Creek	1934		5								6	48			6	48
			1935	2	35	357	1		1				74	1,107			74	1,107
			1936	1		312	7	2.2	7	2.2			11	134			11	134
			Unworked	7	6	909	2	0.2	2	0.2	37	316	368	6,715			405	7,031
			Total	10	46	1,578	10	0.6	10	0.6	37	316	459	8,004			496	8,320
61-52N	1W	Barney Creek	27, 28 Reworked 34	1	29	436	3	0.7	3	0.7	1	4	179	1,069			180	1,063
			1935	2		291	2	0.7	3	1.0			47	205			47	205
			Unworked	2	5	33					42	696	144	2,895			186	3,591
			Total	5	34	760	5	0.6	6	0.6	43	700	370	4,159			413	4,859
51-52N	1-2W	N. Fk. Coeur d'Alene	27, 28 Reworked 33		50	219	16	7.3	41	18.7			10	58			10	58
		River	27, 28 Reworked 34		70	344	7	2.0	9	2.6			10	64			10	64
			1934	3	75	406	3	0.7	3	0.7			99	878			99	878
			Total	6	35	969	26	2.7	53	5.4			119	1,000			119	1,000
51N	2W	Nichols, Beaver,	1927, 1928	1	27	4												
		and Canyon Creeks	27, 28 Reworked 34		45	724	11	1.6	12	1.7			17	62			17	62
			1935	2	15	660							77	232			77	232
			Total	4	7	1,388	11	0.8	12	0.9			94	294			94	294
51N	1-2W	Burnt Cabin and Lone	27, 28 Reworked 33	4	5	295							7				7	
		Cabin Creeks	27, 28 Reworked 34		20	16							1	25			1	25
			1933		40								3	12			3	12
			1934	3	40	311	1	0.3	1	0.3			14	348			14	348
			Total	8	25	622	1	0.1	1	0.1			25				25	
50-51N	1W	Knight, McCauley Cr.	27, 28 Reworked 33	2	10	1,111	1	0.1	1	0.1								
50-51N	1W-1E	Lavin, Leiberg, and	1933	1	50	445	1	0.2	1	0.2	4		58				62	
		Canyon Creeks	1934	5	75	662	2	0.3	2	0.3	10		47				67	
			Unworked	1	70	29	1	3.4	1	3.4	7		25				32	
			Total	9	35	1,136	4	0.4	4	0.35	21		130				151	
61N	3E	Yellow Dog Creek	Not in Control		35	1,836	183	9.9	490	26.6								
51-52N	4E	Big Creek	1934	6	5	3,935	118	2.9	214	5.4	19		56				74	
			1935	5	50	2,755	32	1.1	39	1.4	3		20				23	
			Total	10	55	6,690	150	2.2	253	3.7	22		75				97	
49-50N	4E	Lost, Clee, and	1933	2	51	358	4	1.1	4	1.1			4		1		4	
		Avery Creeks	1934	1	5	409	1	0.2	1	0.2								
			Total	3	56	767	5	0.6	5	0.6			4		1		4	
49-50N	4E	Beaver Creek	1933	4	17	608	96	15.7	313	51.4	65		111			1	177	
			1934	4	5	1,261	34	2.6	42	3.3								
			1935		24	60	3	5.0	45	75.0			26				26	
			1936	2	40	451	2	0.4	2	0.4			54				54	
			Unworked	4	55	1,091	11	1.0	11	1.0	40		32		1	22	94	
			Not in Control	1	70	75					26		5				31	
			Total	17	51	3,546	146	4.1	413	11.6	131		227		1	23	381	
49-50N	3E	Graham Creek	Not in Control	6	1	2,479	27	1.1	150	6.1	1,773		2,069			9	3,851	
50N	2E	Indian Creek	1934		5	289	128	44.2	1,282	443.5	110		147		3	40	297	
49-50N	2E	Thomas, Falls,Smith,	Unworked	6	16	1,372	182	13.2	763	65.6	1,183		611			23	1,817	
		and Spring Creeks	Not in Control	3	7	605	13	2.1	20	3.3	595		260		1	34	889	
			Total	9	23	1,977	195	9.8	783	39.6	1,778		871		1	57	2,706	
		Grand Total		134	10	38,821	894	2.3	3,465	8.1	3,945		6,187		10	129	10,271	

TABLE NO. 6

PINE DISEASE SURVEY, 1937
SUMMARY OF UPLAND STRIPS, KANIKSU AND COEUR D'ALENE NATIONAL FORESTS

T.	R.	Drainage	Year of Work	Distance Run Mi.	Distance Run Ch.	White Pine No. Exam.	White Pine No. Inf.	White Pine Per Cent	Cankers No.	Cankers Per 100 Trees	Years of Infection	Ribes Data: Ribes viscosissimum No.	Ribes viscosissimum Per Acre	Ribes viscosissimum F.L.S.	Ribes viscosissimum Per Acre	Ribes lacustre No.	Ribes lacustre Per Acre	Ribes lacustre F.L.S.	Ribes lacustre Per Acre	Total Ribes No.	Total Ribes Per Acre	Total Ribes F.L.S.	Total Ribes Per Acre
											Kaniksu National Forest												
37-38N	45E	N. Fk. Granite and Tillicum Creek	1934	18	75	12,696	3	.02	3	.02	31, 32, 34	102	2.7	913	24.1	53	1.4	376	9.9	155	4.0	1,289	34.0
			1936	2	75	1,176																	
			Unworked	16	20	9,767						874	26.9	16,370	503.7	2,098	64.5	29,377	903.9	2,972	91.4	45,747	1,407.6
			Total	38	10	23,639	3	.01	3	.01		976	12.8	17,283	226.7	2,151	28.2	29,753	390.2	3,127	41.0	47,036	616.6
36-37N	45E	S. Fk. Granite and Sema Creek	1934	47	28	29,503	14	.04	15	.05	30, 31, 32, 33	478	5.0	2,642	27.9	268	2.8	1,709	18.0	746	7.8	4,351	45.9
			Unworked	43	32	23,928	31	.13	34	.14	30, 31, 32, 33, 34	5,448	62.8	100,535	1,156.2	986	11.3	26,198	301.8	6,434	74.15	126,733	1,460.0
			Total	90	60	53,431	45	.09	49	.10		5,926	29.9	103,177	568.5	1,254	6.9	27,907	153.8	7,180	39.5	131,084	722.2
36N	45E	Bath Creek	Unworked	2	23	315						No ribes data taken											
59N	3W	N. Fk. East River	1931	10	77	5,934	2	.03	2	.03	30, 33	165	7.5	2,337	106.6	457	20.8	7,022	320.3	622	28.3	9,359	426.8
			31 Reworked 37	1	35	87	2	2.29	2	2.3	33	5	1.7	60	20.9	4	1.4	73	25.4	9	3.1	133	46.2
			Unworked	3	15	343	17	4.9	51	14.8	27, 29, 31	377	59.0	4,572	717.0	106	16.0	958	150.2	483	75.7	5,530	867.4
			Total	15	47	6,364	21	.3	55	.8		547	17.0	6,969	223.5	567	18.0	8,053	258.3	1,114	35.7	15,022	481.8
		Grand Total		146	60	83,749	69	.08	107	.1		7,449	25.3	127,429	434.1	3,972	13.5	65,713	223.8	11,421	38.9	193,142	658.0
											Coeur d'Alene National Forest												
52-53N	1-2W	Sob, Tom Lavin, Honey, Solitaire, and Pyrite Creeks	1933		30	58										2	2.0	13	17.3	2	2.0	13	17.3
			1934	3	2	226						1		3						1		3	
			Total	3	32	284						1		3		2		13		3		16	2.3
51-52N	1W	Barney Creek	Unworked	5	35	566	10	1.7	17	3.0	30, 31, 32, 34	55	5.0	380	34.9	156	14.0	1,692	155.5	211	19.4	2,072	190.5
51N	2W	Nichols,Canyon Cr.	Unworked	3	50	202						13	2.0	200	27.5	29	4.0	192	26.4	42	5.7	392	54.0
49-50N	4E	Lost, Clee and Avery Creeks	1933		49	202	1	.4	1	.4	33	1	1.0							1			
49-50N	4E	Beaver Creek	1933		15	22	17	77.2															
			Not in Control	2	5	56						27	6.0							27	6.0		
			Total	2	20	78	17	21.7				27	6.0							27	6.0		
49-50N	4E	Graham Creek	Not in Control		16	634						214	535.0			62	155.0			276	69.0		
50N	2E	Steamboat Creek	Not in Control		66	798	286	35.8	818	102.5	27, 30, 31, 32, 33, 34	2,138	1,295.0			143	86.0			2,281	1,382.4		
49-50N	2E	Thomas, Falls, Smith,Spring Cr.	Unworked	1	43	476	65	13.6	1,273	267.4	30, 31, 32, 33, 34	635	206.0			44	14.0			679	220.8		
		Grand Total		17	71	3,240	379	11.7	2,109	65.1		3,084	66.2	583	16.3	436	12.1	1,897	53.0	3,520	98.4		

[illegible]

1\. [illegible] work [illegible] as possible [illegible] has been performed. [illegible] and rate of increase of the rust [illegible] initial work and rework and will be essential [illegible] the rework job on various areas.

2\. The 1937 survey shows the [illegible] some areas; also a zone along the stream where the upland ribes [illegible] greatest influence of the moist stream type conditions. [illegible] little more time a more complete story can be obtained of the [illegible] numbers of ribes or amounts of live stem remaining in the upland. [illegible] being formulated for running strips in some of the upland types [illegible] two or three years. In determining any change in rate of increase [illegible] sary to determine the definite percentage of infection for various [illegible] is felt that the determining of the percentage at definite intervals [illegible] years may obviate the tremendous amount of work involved in [illegible] ing the years of infection for individual trees. For example, [illegible] some strips were run on areas worked in 1935. This gives [illegible] centage of infection at the time of eradication, also for [illegible] or, as the data have been compiled in this report, for the year [illegible] is therefore definitely established for the period up to the time [illegible] eradication work was performed. By running the same strips in [illegible] or 1942 the percentage of infection will be determined for those years [illegible] showing any change in the rate of increase after ribes eradication [illegible]

3\. Special reports will be written as data are compiled [illegible] the distance of spread, the correlation between the amount of [illegible] number of ribes or amount of infection and the amount of ribes [illegible] the rate of increase of the rust at various distances from the [illegible] various types.

4\. Additional plot studies should be carried on with [illegible] located in unworked areas in order to procure infection and ribes [illegible] parable basis from the start of the plot work. Studies should [illegible] on to show the effect of parasitic fungi in reducing aecial production [illegible]

5\. It is planned to build up data on infection in mature [illegible] stands and information on a basis for estimating damage in [illegible] as fast as the opportunity is afforded.

[illegible]

by

[illegible]

Assistant Pathologist

INTRODUCTION

Besides the general survey to determine the distribution of [illegible] permanent plot studies were inaugurated as a part of the general [illegible] project and supplementary to that project. Seven permanent plots were [illegible] and studied during the 1937 season. Individual detailed reports are [illegible] for each plot.

LOCATION OF WORK

All of the plots are in the St. Joe National Forest in Idaho. [illegible] Creek plot is located about fifteen miles east of Avery while the other [illegible] in the Clarkia-Bovill-Elk River area. The more specific land designation [illegible] plot is given in Table No. 1.

GENERAL DESCRIPTION OF THE PLOTS

All of the plots are in white pine reproduction. The majority [illegible] trees are under twenty years of age, with occasional trees somewhat [illegible] general characteristics of each plot, the blister rust hosts and [illegible] history for each plot are shown in Table No. 1.

TABLE NO. 1

GENERAL LOCATION AND DESCRIPTION OF PLOTS

Plot	T	R	S	Elev.	Slope Facing	Slope Percent	Size Plot Acres	No. White Pine	Per Cent Inf.	Total Ribes R. [illegible] Bu.	R. [illegible] FLS	R. lac. Bu.	R. lac. FLS	R. [illegible] Bu.	R. [illegible] FLS	R. [illegible] Bu.	R. [illegible] FLS	Total Bu.	Total FLS	[illegible]	[illegible]
Bird Cr.	45N	[illegible]	6-7	3500-4500	NW	70	[illegible]	16,045	65.7	396	5,758	729	3,152	3	64	12	142	1,140	10,115	1950 [illegible]	[illegible]
Crystal Cr. Plot I	44N	15	21	3600	SE	50-56	1.8	429	58.1	199	2,491	5	61					[illegible]	2,352	[illegible]	[illegible]
Crystal Cr. Plot II	44N	17	16-21	3600	SW	30-40	5.5	360	67.7	905	22,984		151		1,000			915	23,[illegible]	[illegible]	[illegible]
Marble Fork St. Maries	43N	24	23-24	3500-[illegible]	NE	60	2.0	5,485	41.5	14	71	128	297					142	395	[illegible]	[illegible]
Three Bear Cr.	39N	[illegible]	14	[illegible]	[illegible]	[illegible]	[illegible]	284	56.0	[illegible]	3	11	58					[illegible]	56	[illegible]	
Lone Meadow Cr.	[illegible]	[illegible]	14	[illegible]	[illegible]	[illegible]	[illegible]	1,296	11.2	11	150	31	1,038					[illegible]	[illegible]	[illegible]	
[illegible] Cr.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2,282	50.1	[illegible]	78	[illegible]	58	10	[illegible]			[illegible]	[illegible]	[illegible]	

[illegible]

The primary objectives are as follows:

1. Determine the effectiveness of current eradication work [illegible] done as indicated in Table No. 1. Since the plots are permanent they [illegible] information of present value and will serve as future check plots.

2. Determine the rate of increase of the disease under [illegible] ditions.

3. Determine the effect upon the stand of the present disease [illegible] tions.

4. Determine the effect of stream type upon infection, especially [illegible] spread to upland types.

5. Determine whether there are any correlations between [illegible] amount of disease.

6. Obtain any other incidental information of value to a better under-standing of the disease.

METHODS

In the selection of the plots, areas were chosen which are [illegible] infected and have a fairly good stand of reproduction. Each plot [illegible] chain-wide strip starting at the stream and extending at right angles to the [illegible] of a ridge or to the limits of white pine.

As the plot was developed each square chain was measured off and the boundary marked with string. Only surface measurements were made and no adjustments for topography were made. These square chain transects were again sub-divided into linear blocks parallel to the contour, the number of these sub-divisions depending upon the density of the flora on the transect.

The crew consisted of two inspectors and one recorder who worked back and forth taking complete data as they progressed along each work strip. All data were recorded separately for each work strip and transect.

Each white pine and ribes was inspected. The following data were recorded by individual trees: height of each white pine, whether infected or not, number of cankers, year wood on which each canker occurred, whether on the trunk or a limb, and finally an estimate was made of whether the disease would probably kill the tree. For the ribes the data include the species and [illegible] live stem by bushes, whether the bush was infected or not, and if the area had been eradicated whether the bush was a seedling, old bush, or had [illegible] developed from a poorly eradicated bush. In addition to the above data, [illegible]

two Crystal Creek plots, since the pine and ribes were ... location of each host plant was recorded ... ship to the other host plants studied.

RESULTS

While most of these plots involve long term studies, they ... data of present value. Reports on these plots are being prepared ... lowing subjects under consideration:

1. Relation of amount of ribes to amount of pine infection.

2. Effect of varying amounts of ribes on rate of increase ... infection with special reference to the change in rate of increase resulting from reductions in amount of ribes.

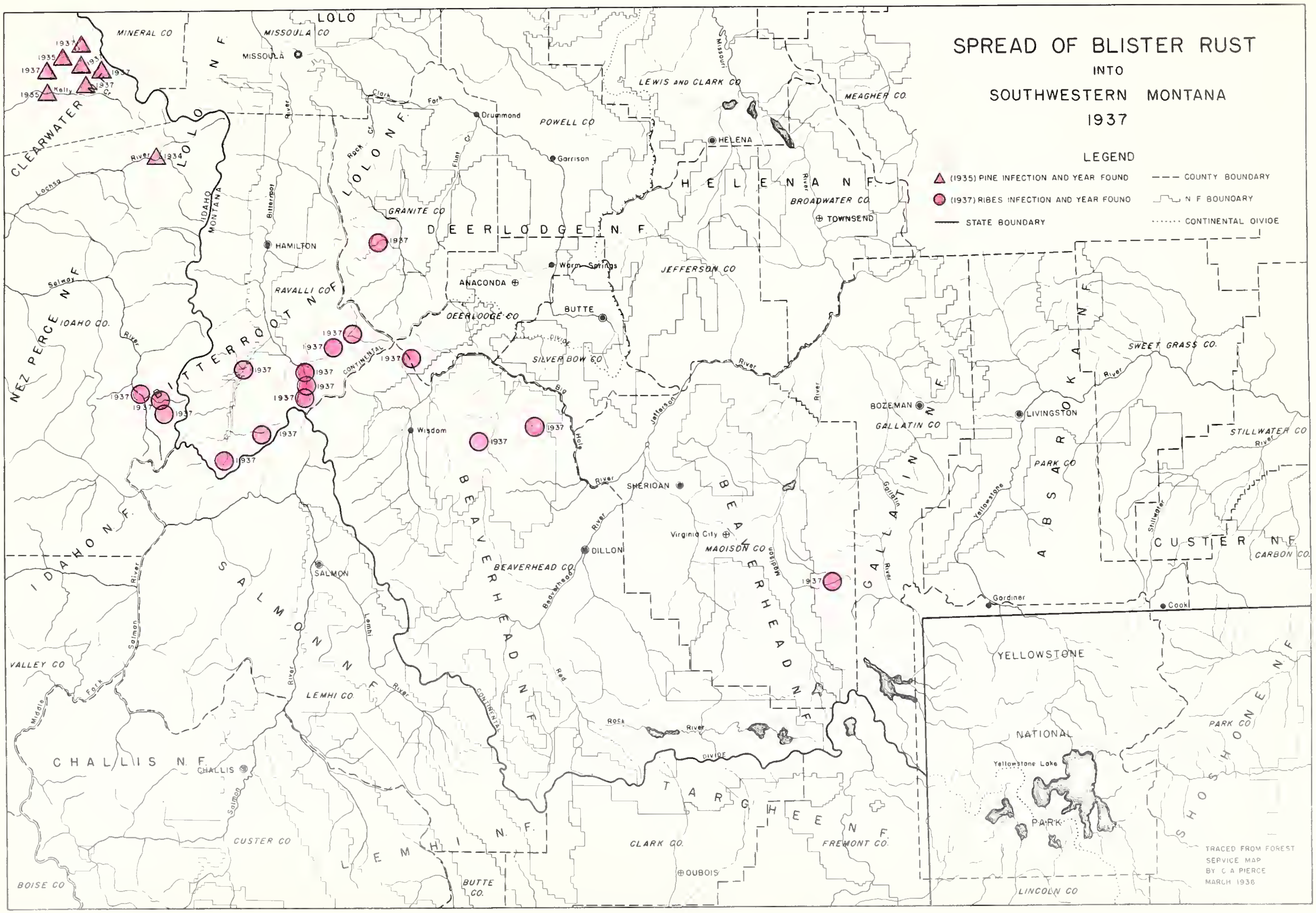
[illegible]

[illegible]

The only work done on the [illegible] Lake plot in [illegible] was to [illegible] the pine for new cankers and inspect the ribes for infection. This was [illegible] during the period October [illegible] to 15.

An inspection of the pine showed eleven new trees infected with cankers and several previously infected trees bearing 27 new cankers. The inspection of the ribes proved to be very unsatisfactory because of the [illegible] the season. The results of the inspection of the bushes were as [illegible] 106, defoliated 142, not infected [illegible], infected 105. [illegible] those [illegible] bear some leaves were so heavily defoliated that only a very small [illegible] the original leaves was available for inspection.

It is recommended that if further inspection of the ribes [illegible] ducted on this plot the work be done in August before the leaves [illegible] fall.



ANNUAL REPORT 1937
EDWARD L. JOY

[illegible]

by

[illegible]

INTRODUCTION

During the years 1934 to 1937 work has been done by [illegible] Plant Disease Control to secure basic blister rust [illegible] Wyoming. Such information is being gathered as a [illegible] bility of a regional control program in the [illegible] decision that must be made by those responsible for the [illegible] lands.

The first phase of this basic work was started in [illegible] determine the acreage of five-needle pines and the [illegible] in the forests of Colorado and Wyoming. This survey showed [illegible] these pines, namely, Pinus albicaulis, P. flexilis and P. [illegible] important part of the timber cover on a large acreage [illegible] forests, national parks and Indian reservations. Since the [illegible] timber appears to be sufficiently great to justify protection from [illegible] the second phase of the basic work or ribes eradication from which [illegible] costs can be determined, was started in 1935 and continued in 1936 [illegible]

The third part of this initial work is scouting to determine [illegible] of blister rust invasion of the region. A systematic scouting for [illegible] not been possible for the entire region. In 1937 a small crew [illegible] of the disease southeastward from known areas of infection in [illegible] Wyoming. The important results of this work are summarized as [illegible]

1. Sixteen locations of infection, all of which were on [illegible] found. (See map).

2. The rust was found on ribes on four national forests in [illegible] namely, the Bitterroot, Beaverhead, Deerlodge and Gallatin. The [illegible] of scouting failed to disclose infection locations on the [illegible] Forest in Montana and Yellowstone National Park in Wyoming.

3. The most eastern infection location found [illegible] National Forest within [illegible] miles of the northwest corner of [illegible] National Park and twenty-six miles of the Wyoming line.

4. Discovery of rust on the Beaverhead forest [illegible] tension of the known range of the disease [illegible] tinental Divide.

The scouting in and adjacent to Yellowstone [illegible] by ribes [illegible] and leaf [illegible] This necessitated the discontinuance of work [illegible]

[illegible] amount of ground had been covered. [illegible] that the meager amount of scouting done there would reveal the only [illegible] in that vicinity, it is believed that undiscovered infections exist [illegible] Wyoming and adjacent Montana and Idaho.

The summary of all ribes eradication work done in Colorado and [illegible] and detailed accounts of the 1937 work in each state are the subject [illegible] port

COOPERATION

The continued cooperation of the U. S. Forest Service, the [illegible] Park Service, Colorado Agricultural College and the University of Wyoming [illegible] received. Both the college and the university continued the cooperative [illegible] ments on this work with the Bureau of Entomology and Plant Quarantine [illegible] special benefit was the contribution from the University of Wyoming [illegible] of office space and facilities for a regional headquarters

ORGANIZATION AND ADMINISTRATION

Direction of the Central Rocky Mountain Region work is the respon[illegible] bility of a leader and an assistant leader. Assisting personnel consists [illegible] an appointee and a selected reliefer assistant for each camp.

The full-time personnel of the Division of Plant Disease Control [illegible] sponsible for the direction of this work are Edward L. Joy, in charge, [illegible] Clarence M. Chapman, assistant. During the 1937 season, immediate supervi[illegible] of field activities was the responsibility of Mr. Chapman. Assisting [illegible] under temporary appointment were Thoburn B. Thompson in Colorado [illegible] First in Wyoming.

The continuation of ribes eradication work with WPA funds [illegible] the use of only certified reliefers for crew labor. These were [illegible] the district Works Progress Administration offices in accordance with [illegible] procedure inaugurated in 1936. Although only one camp was operated [illegible] this year it was impossible during most of the season to secure enough [illegible] keep the camp at full strength

WORK AREAS

Three areas, which are reasonably typical of working conditions [illegible] will be encountered in most of the five needle pine types of this [illegible] selected in 1935 and 1936 for the ribes eradication work. These [illegible] vicinity of Brooks Lake on the Washakie National Forest in northwestern [illegible] (2) the Pole Mountain District of the Medicine Bow National Forest in [illegible] eastern Wyoming, and (3) the Rosemont-Clyde area on the Pike National [illegible] Colorado. In order to secure reasonably accurate cost data from [illegible] areas, it was thought advisable to work at least 10,000 acres of [illegible] complish this objective, the 1937 work was done on the Pole Mountain [illegible]

[illegible] years of work as follows: [illegible] one 60 [illegible] man camp in 1936; [illegible] from July 1936 to December 1937; and the [illegible] 1935, two camps totalling 100 men in 1936, and one 60 man camp in [illegible] completion of the 1937 work. The total area of each unit [illegible] 10,455 acres, 11,302 acres and 14,675 acres.

SPECIAL STUDIES

Studies to determine the practicability of ribes eradication [illegible] cals were started in 1935. These tests indicated that Diesel oil on [illegible] Ribes cereum and intact R. montigenum and Atlacide spray on intact [illegible] might prove satisfactory. Further tests of these chemicals were [illegible] and again in 1937. In addition plots were established in 1937 to [illegible] chloride in solution applied to intact R. cereum.

The 1937 check of experimental chemical eradication work [illegible] and 1936 resulted in definite findings that (1) [illegible] R. cereum [illegible] be killed with Diesel oil applied to the crown, (2) intact R. montigenum [illegible] killed with either an aqueous solution of [illegible] applied as spray to [illegible] stems and crowns or Diesel oil applied in a similar manner, and (3) [illegible] R. inerme is not satisfactorily eradicated with an aqueous solution of [illegible] Further study of Diesel oil on intact R. montigenum is necessary [illegible] [illegible] of quantity and application of the oil are known.

In 1937 a special problem appeared when large numbers of [illegible] developed both on disturbed ground from which ribes had been eradicated [illegible] undisturbed bushes. During the season, plots were established to [illegible] dance and survival of these seedlings. On the plots from which ribes [illegible] eradicated, data will also be secured on the development of [illegible] several plots were treated with dry sodium chlorate as a study of [illegible] seedling development.

METHODS AND EQUIPMENT

Hand eradication with a heavy mattock was the principal [illegible] 1937. This method appears to be satisfactory for most [illegible] of Diesel oil or Atlacide on limited areas with heavy ribes growth [illegible] large individual bushes with [illegible] would be a satisfactory [illegible] method. The limitations of funds prevented the purchase of sufficient [illegible] and equipment to permit the use of the chemical method [illegible]

Both the three-man and the [illegible] crews were used [illegible] according to the eradication difficulties encountered. [illegible] a scattered ribes population and where the bushes are [illegible] is done effectively by a three-man crew. In areas where [illegible] growth and on rocky sites where [illegible] crew is used. In some instances a [illegible] crew [illegible] and the crew leader checking [illegible] the number of incompletely eradicated bush groups.

The primary purpose of checking is to secure [illegible] survey of worked area, detailed information on the amount and distribution of remaining ribes. On the basis of these data, the efficiency of eradication work can be maintained on a high standard.

In each camp the checking work was done by one or more specially trained relief checkers working under the direct supervision of the camp [illegible]. Their work included advance survey and regular checking and the related [illegible] and data summary work. Under the close supervision of camp bosses without [illegible] checking experience, this method has proved satisfactory.

RESULTS AND COSTS

There follow Tables Nos. 1 to 5 which show regional ribes eradication results and costs and Tables Nos. 7 and 8 which give the expenditures for [illegible]

TABLE NO. 1

SUMMARY OF RIBES ERADICATION RESULTS AND COSTS, 1937
[illegible]

State	Total Acres	Total Man Days	Eff.* Man Days	Total Ribes	[illegible]	Per Acre: Eff. Man Days	Per Acre: Ribes	Cost per Eff. Man Day
Colorado	6,[illegible]	2,889	1,875	22,[illegible]	[illegible]	[illegible]	12	[illegible]
Wyoming	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Both States	10,412	[illegible]	4,0[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

*Eight hours constitute one man day.

[illegible]

[illegible]

State	Year	Total Acres	Effec. Man Days	Total Ribes	Per Acre Eff. Man Days	Per Acre Ribes	Cost per Eff. Man Day	[illegible]
Colorado	1935	2,257	1,503	146,504	[illegible]	[illegible]	$3.4[illegible]	[illegible]
	1936	5,591	2,982	157,848	[illegible]	28	[illegible]	[illegible]
	1937	6,830	1,675	82,423	[illegible]	12	[illegible]	[illegible]
	Total	14,672	6,160	388,045	[illegible]	26	[illegible]	[illegible]
Wyoming	1935	[illegible],126	706	85,42[illegible]	[illegible]	14	[illegible]	[illegible]
	1936	[illegible]	3,865	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	1937	3,582	2,369	320,701	[illegible]	[illegible]	[illegible]	[illegible]
	Total	21,760	6,940	1,0[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Regional Total		[illegible],438	13,100	[illegible]	36	40	$3.36	[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Open Reproduction	3,064	871	[illegible]	[illegible]	[illegible]
Open Pole	[illegible]	3,744	[illegible]	[illegible]	[illegible]
Open Mature	[illegible]	59	[illegible]	[illegible]	[illegible]
Semi-Dense	754	[illegible]	[illegible]	[illegible]	[illegible]
All Stands	10,202	[illegible]	[illegible]	[illegible]	[illegible]
Meadow	157			[illegible]	[illegible]
[illegible]	17	[illegible]	[illegible]	[illegible]	[illegible]
All Types	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

Vegetation Type	Acres [illegible]	[illegible]			[illegible]
		[illegible]	[illegible]	[illegible]	
Open Reproduction	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Open Pole	[illegible]	[illegible]	356,694	[illegible]	[illegible]
Open Mature	[illegible]	1,271	[illegible]	98	[illegible]
Semi-Dense	754	0	[illegible]	[illegible]	[illegible]
All Stands	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Meadow	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
All Types	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Eradication Type	Acres First Working	[illegible] Man Days	Total Sites	[illegible]	
Open [illegible]	4,564	871	[illegible]	.50	
Open Pole	20,081	4,418	817,6[illegible]	.40	[illegible]
Open Mature	138	58	1,642	.30	[illegible]
Dense Mature	6,507	1,140	201,51[illegible]	.18	[illegible]
Burn	7,336	[illegible]	83,637	.48	[illegible]
Bare-Grass	1,379	376	30,848	.29	[illegible]
Timber Line*	72	111	41,558	1.54	[illegible]
All Upland	34,378	11,780	1,2[illegible]	.34	[illegible]
Meadow	1,596	0	0	.00	
Stream	50[illegible]	1,3[illegible]	25[illegible]	[illegible]	[illegible]
All Types	36,[illegible]	13,[illegible]	1,4[illegible]	.35	[illegible]

*Previously designated as subalpine type.

TABLE NO. 6

[illegible]
CENTRAL ROCKY MOUNTAIN REGION

Eradication Type	Acres First Working	Sites by Species					
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Open [illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
Open Pole	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Open Mature	138	[illegible]	[illegible]	[illegible]	[illegible]		
Dense Mature	6,507	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]
Burn	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Bare-Grass	1,379	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Timber Line*	72	[illegible]	0	[illegible]	0	[illegible]	[illegible]
All Upland	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Meadow	1,596	0	0	0	0	0	
Stream	50[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
All Types	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

*Previously designated as subalpine type.

[illegible]

[illegible]

Cooperating Agency	Appropriation	Amount	
		Colorado	[illegible]
Bureau of Entomology and Plant Quarantine	Regular	$ 1,336.63	[illegible]
	[illegible]	12,565.51	[illegible]
	Total	13,872.14	[illegible]
Total Expenditures	All Appropriations	$13,[illegible]	[illegible]

[illegible]

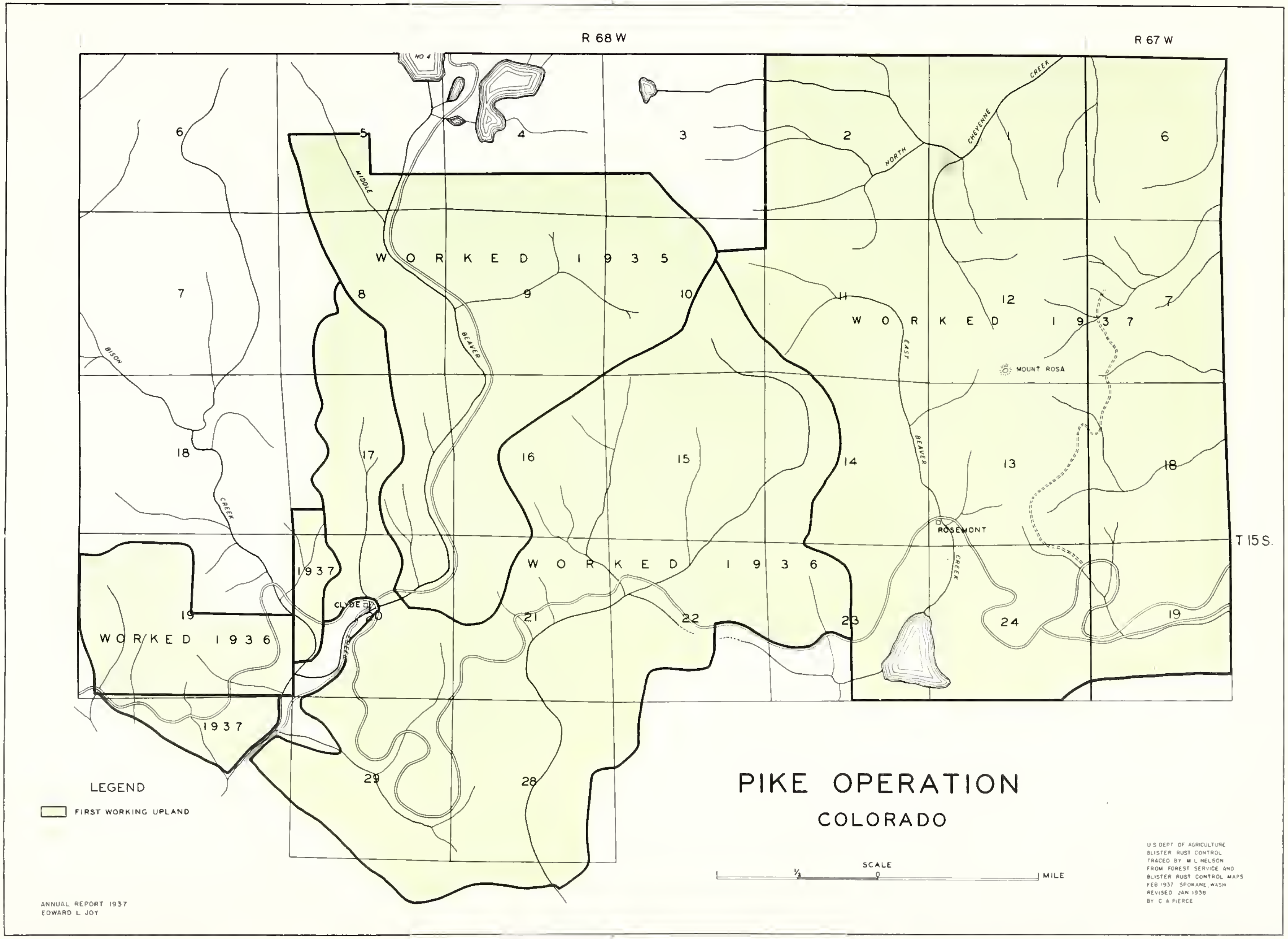
[illegible]

Item	Colorado Operation Bureau of Entomology and Plant Quarantine			[illegible] Operation Bureau of Entomology and Plant Quarantine		
	Regular	[illegible]	Total	Regular	[illegible]	Total
Salaries Permanent Men	[illegible]	$ [illegible]	$ 2,986.61	$1,[illegible]	[illegible]	[illegible]
Salaries Temporary Men		1,125.67	[illegible]		[illegible]	[illegible]
[illegible] Labor		2,139.85	[illegible]		[illegible]	[illegible]
Subsistence Supplies		1,722.81	1,722.81		[illegible]	[illegible]
Equipment					[illegible]	[illegible]
Travel & Transportation		983.87	983.87		[illegible]	[illegible]
[illegible]		502.64	502.64			
Other Supplies		410.79	410.79		[illegible]	[illegible]
Total	$1,336.63	$12,535.51	$13,872.14	$1,[illegible]	[illegible]	[illegible]

	Colorado	Wyoming	[illegible]
Total number meals served	10,976	10,[illegible]	[illegible]
Cost of subsistence supplies	$1,722.81	$1,740.12	[illegible]
Average cost per meal	$ 0.157	$ [illegible] .174	$ [illegible]

[illegible] 1938

During 1938 four lines of work should be conducted to [illegible] supplementary data that are needed. These are (1) initial work on a [illegible] acreage in order to make a practical test of eradication with chemicals, [illegible] rework by both the hand and chemical methods of a portion of the area worked in 1935 to determine rework costs and secure data on the rework [illegible] checking chemical plots and further plot tests of chemicals where need for [illegible] is indicated, and (4) checking ribes seedling plots and extension of the eco- logical studies to secure information on the growth and regeneration of ribes after eradication. Most of this work should be done on the Rosemont-[illegible] area of the Pike forest in Colorado because it is the only worked unit on which occur all three of the principal ribes species of the region. The checking of chemical eradication and ecology plots already established in Wyoming should be done at some time during the season.


PIKE OPERATION
COLORADO
R 68 W
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T 15 S.
WORKED 1935
WORKED 1937
WORKED 1936
WORKED 1936
1937
1937
MOUNT ROSA
ROSEMONT
CLYDE
NO 4
NORTH CHEYENNE CREEK
EAST BEAVER CREEK
MIDDLE BEAVER CREEK
BISON CREEK
LEGEND
FIRST WORKING UPLAND
SCALE
1/2 0 1 MILE
ANNUAL REPORT 1937
EDWARD L. JOY
U S DEPT OF AGRICULTURE
BLISTER RUST CONTROL
TRACED BY M L NELSON
FROM FOREST SERVICE AND
BLISTER RUST CONTROL MAPS
FEB 1937 SPOKANE, WASH
REVISED JAN 1938
BY C A PIERCE

PROJECT REPORTS

EXPERIMENTAL RIBES ERADICATION, PIKE NATIONAL FOREST, COLORADO, 1937

INTRODUCTION

Work in Colorado was started on June 4 with the establishment of a camp on East Beaver Creek about one mile above Rosemont. This location, which is within the 1937 work area, is approximately 25 miles from Colorado Springs via the Corley Mountain Highway. Ribes eradication work was started on June [illegible] and continued through September 16.

Throughout the season difficulty was experienced in securing a sufficient number of workers to keep the camp at full strength. Although most of the men employed came from Colorado Springs and vicinity, it became necessary for the WPA to make some assignments from more distant points. At no time were there available men in sufficient numbers to permit any selection of workers.

CAMP SUPPLY

As in previous years, most of the supplies were procured from the Forest Service Central Purchase in Denver. These were shipped by freight to Colorado Springs from which point they were transported to the camp by Government-owned truck. This proved to be the most economical way of supplying a single camp.

WORKING UNIT

In 1935 and 1936 relatively [illegible] working conditions were encountered on the working units in the [illegible] and Gould Creek drainages. Eastward from these drainages and particularly on the east-facing slope of Mt. Rosa the working conditions [illegible] typical of a fairly large part of the five-needle pine type in the [illegible] district. Consequently it was believed essential, for [illegible] data, to perform at least one season's work in this type. This was done in 1937 when work was completed on an area surrounding Mt. Rosa. This area includes the headwaters of East Beaver, Little Fountain, South Cheyenne and North Cheyenne Creeks.

TIMBER COVER

A large part of the area worked in 1937 is east facing, [illegible] worked in 1935 and 1936 have a southern exposure. On many of the [illegible] slopes a relatively sparse plant cover prevails, probably due chiefly to [illegible] higher soil temperatures in summer. Much of this area like most of the [illegible] Peak district was burned over about 50 years ago. The [illegible] course of the fires generally resulted in patches and stringers of [illegible] intermingled with areas of young growth. The 1937 [illegible]

A 1209. East Beaver Creek portion of the area worked in 1937. Pike National Forest, Colorado

[illegible] open reproduction, a type not previously encountered. The [illegible] species in this type is limber pine which favors the exposed slopes. An indication of the relative abundance of this species comes from data on [illegible] stocking that shows 61.1 per cent of all conifers to be limber pine.

Most of the area not classed as reproduction is open pole type. This is the predominant type for the entire acreage worked during the three years, accounting for 57 per cent of the total. This type includes all of the native conifers with Engelmann spruce predominating where deep, moist soil occurs and bristlecone pine or limber pine the most abundant species on the drier and rocky sites. Associated species are alpine fir, Douglas fir and yellow pine.

RIBES

For the third successive year only the three major ribes species of the Pikes Peak district were found. R. montigenum continued as the most abundant species with R. inerme second and R. cereum last. It is notable that although R. inerme was second in abundance in both 1935 and 1937, totals for the three years show this species and R. cereum to be approximately equal in abundance. Table No. 1 shows the relative abundance of the ribes species in the three years.

TABLE NO. 1

DISTRIBUTION BY SPECIES OF ERADICATED RIBES, 1935 - 1937
PIKE OPERATION, COLORADO

Ribes Species	Per Cent of Eradicated Bushes			
	1935	1936	1937	All
R. montigenum	85.[illegible]	70.5	77.3	76.2
R. inerme	6.[illegible]	12.[illegible]	12.3	12.[illegible]
R. cereum	[illegible]	17.4	10.4	10.6

SPECIAL STUDIES

A study of the seedling and sprout development after eradication was started in 1937 with the establishment of several small plots in locations where ribes had been eradicated in 1935 or 1936. The data secured, although meager, show that both sprouts and seedlings occurred where R. montigenum and R. inerme had been removed but none were found on R. cereum locations. However, it is known from studies made in Wyoming that both sprouts and seedlings of R. cereum are a problem following eradication.

On areas worked in 1935 there were both one and two year old seedlings of R. montigenum and R. inerme. On areas worked in 1936 most of the seedlings were one year old. These results show that seedling germination [illegible] will commence one year after the eradication disturbance and continue [illegible] for the second year.

Original stem or sprouts were found on about 50 per cent of the locations of eradicated *R. montigenum* and *R. inerme* bushes. This is a much higher percentage of incompletely pulled bushes than occurs throughout the worked areas, but is indicative of conditions that occur where large numbers of these ribes were encountered among rocks or brush.

More extensive studies of the growth and regeneration of ribes will be made in 1938. Data from the 1937 studies are shown in the following table

TABLE NO. 2

GROWTH AND REGENERATION OF RIBES FOLLOWING RIBES ERADICATION
PIKE OPERATION, COLORADO

Ribes Species	Year Area Worked	No. Plots	No. Bushes Prel.	F.L. & Pred.	Area Disturbed (sq. ft.)	Ribes Found 1937						
							Root Live Stem			Number Seedlings		
						Bushes	Old Stem	Sprouts	Total	1 yr.	2 yr.	Total
R. mont.	1935	2	6	3,400	112	1	0	6	6	31	21	52
	1936	4	7	5,000	138	[illegible]	0	24	24	5	0	5
R. [illegible]	1935	1	4	2,500	25	3	11	1	12	36	14	50
	1936	3	20	6,500	1,600	8	6	69	75	76	2	78
R. [illegible]	1935	3	10	1,400	20	0	0	0	0	0	0	0
	1936	3	9	3,500	100	0	0	0	0	0	0	0

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

A major objective on each job is to apply [illegible] of total worked time on ribes eradication. [illegible] the short schedule of 110 hours per man month gave very little opportunity to establish the desired relation between field time and camp operation and [illegible] time. It is gratifying though that approximately 65 per cent of the total time was spent on ribes eradication in 1937 which is somewhat higher than the three-year Colorado average of 59.3 per cent.

Table No. 4 gives the analysis of [illegible] time according to [illegible] of work performed.

TABLE NO. 4

ANALYSIS OF [illegible] TIME
PIKE [illegible] COLORADO

Time Classification	Man Hours	Man Days	Percent
Ribes eradication	1[illegible] 593	[illegible]	[illegible]
Ribes eradication (check)	81	10	[illegible]
Recruiting personnel	1,3[illegible]	[illegible]	[illegible]
Kitchen	2,135	267	[illegible]
Camp maintenance	2,619	[illegible]	[illegible]
Camp wood	750	94	[illegible]
Travel	131	[illegible]	[illegible]
Contributed (roads)	17[illegible]	[illegible]	[illegible]
Total	20,9[illegible]	[illegible]	[illegible]

Summaries of the 1937 eradication and [illegible] data and of the combined eradication data for the period 1935-1937 are given in Tables Nos. [illegible] to 9.

TABLE NO. 5

[illegible]

Condition Type	Acres Forest	[illegible]	Total Acres	[illegible]	Total [illegible]	[illegible]	[illegible]
Open Reproduction ([illegible])	4,191	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Open Pole	1,677		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Open Mature	157	39	196	[illegible]	[illegible]	[illegible]	
All Timber	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
All Types*	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

*Does not include 70 acres of water.

TABLE NO. 6

[illegible]

Condition Type	Total Acres	[illegible]	[illegible]	[illegible]	[illegible]
Open Reproduction	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Open Pole	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Open Mature	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
All Timber	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
All Types	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]	Acres In Checked Area	Acres Checked	Average Results for All [illegible]					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

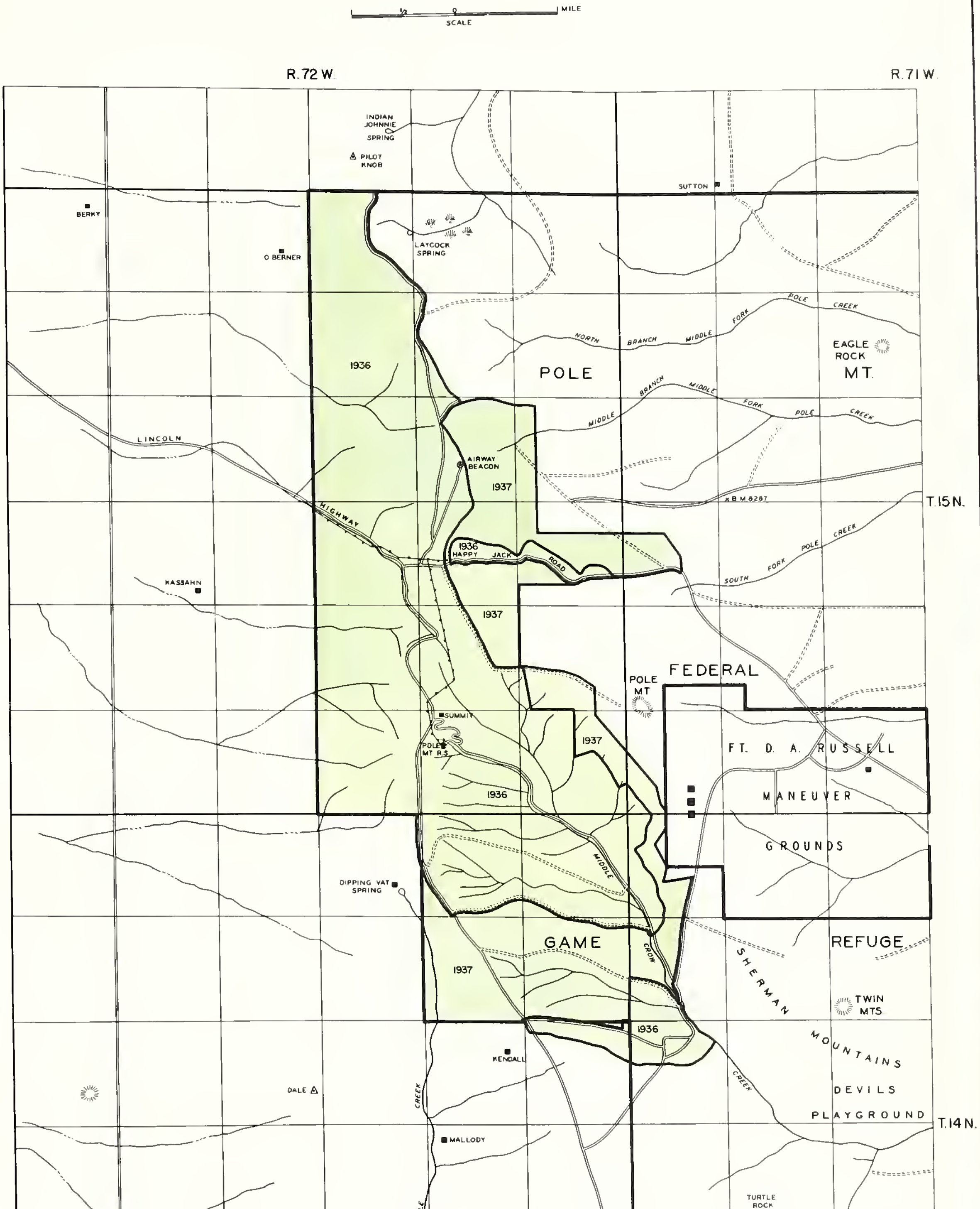
[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

The fact that changes in working time per acre have not been in the same ratio as changes in amounts of ribes removed emphasizes the point that factors other than ribes abundance affect the eradication time. Although several of the factors influencing working time on these three areas are known, undoubtedly the one of first importance is working difficulty. Examples of the extremes in this that have been encountered are the steep, rocky and brushy western slopes of Eagle Mountain where *R. montigenum* grew in abundance and the moderately steep but smooth and open eastern slope of Mt. Rosa where only scattered ribes occurred. The former was worked in 1935 and the latter in 1937.

MEDICINE BOW OPERATION

WYOMING



LEGEND

FIRST WORKING

ANNUAL REPORT 1937
EDWARD L JOY

U.S. DEPT OF AGRICULTURE
BLISTER RUST CONTROL
TRACED BY M L NELSON
FROM FOREST SERVICE AND
BLISTER RUST CONTROL MAPS
FEB. 1937 SPOKANE, WASH
REVISED JAN 1938
BY H H HORR

[illegible]

[illegible]

The [illegible] Mountain [illegible] in the [illegible] National Forest was selected in 1926 for the location of an experimental [illegible] camp. [illegible] work from the camp was started on the area in [illegible] after closing the camp in October. The work was continued by a [illegible] of [illegible] men from [illegible].

From May to October 1927 work was again conducted from [illegible] following closing of this camp the work was continued through December [illegible] trucked from [illegible]. This report [illegible] work on [illegible] Mountain area during the entire calendar year.

[illegible]

All supplies for the camp were [illegible] in Denver. These were shipped by [illegible] made by the camp truck. This method of [illegible] economical than [illegible] transportation [illegible] distance [illegible].

[illegible]

In 1926 [illegible] was conducted [illegible] boundary of the [illegible] district [illegible] miles in width. In general this area [illegible] with [illegible] from [illegible]. A large part of [illegible] is rolling [illegible] of [illegible] pine. [illegible] of this area [illegible] and the [illegible] Mountain range. [illegible] of the 1927 work was [illegible].

[illegible]

[illegible] in the [illegible] 1927 [illegible] density and composition of [illegible] of the [illegible] and [illegible] Douglas fir [illegible] spruce and aspen.

[illegible]

[illegible] work. Although [illegible] is the [illegible] in the [illegible] of the [illegible] is shown in table No. 1.

A 1234. Portion of area worked in 1937 on southwest slope of Pole Mountain, Medicine Bow National Forest, Wyoming

[illegible]

[illegible]

During the [illegible]

[illegible]

The personnel [illegible]

The [illegible]

TABLE NO. 7

[illegible]

Habitat Type	Acres Sampled	B. corona Bu.*	[illegible]	[illegible]	[illegible]	C. flex	S. [illegible]	P. [illegible]	Pseu. tax	Pic. [illegible]	Pop. [illegible]	All conifers	Dec. trees
[illegible]	[illegible]	17	[illegible]	[illegible]	[illegible]	6	[illegible]	[illegible]	[illegible]	T	T	15	65
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	34	209	9	[illegible]	T		276	230
[illegible]	[illegible]	31	[illegible]	1	138	21	[illegible]	[illegible]	5			66	151
[illegible]	[illegible]	45	[illegible]	[illegible]	[illegible]	80	[illegible]	3	122	T	T	103	[illegible]
[illegible]	[illegible]	46	[illegible]	[illegible]	[illegible]	67	[illegible]	[illegible]	[illegible]	T	T	90	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	12	[illegible]	[illegible]		T	T	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			41	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	T	T	[illegible]	[illegible]
[illegible]						[illegible]	[illegible]	[illegible]	[illegible]	T	T	[illegible]	

[illegible]

A study of the [illegible] seedlings in Wyoming [illegible] plots, [illegible] ground [illegible] seedlings [illegible] occurring on [illegible] seedlings will occur [illegible] because this species [illegible] seedlings on disturbed and [illegible] large amount of seed germination. [illegible] fact that [illegible] seedlings [illegible] in Colorado [illegible]

[illegible]

TABLE NO. [illegible]

GROWTH AND REGENERATION OF RIBES FOLLOWING RIBES ERADICATION
MEDICINE BOW AND WASHAKIE OPERATIONS, WYOMING

Areas Examined	Tour Area Worked	No. Plots	No. Bushes Acre	P.I.S. Tree	Trees [illegible]	[illegible]	Old	Feet Live Stem [illegible]	[illegible]	Bushes [illegible]	[illegible]	Total
MEDICINE BOW NATIONAL FOREST												
[illegible]	1946		7	1,118	[illegible]		8	90	[illegible]	241	1	[illegible]
[illegible]	1946		11	1,010	[illegible]	[illegible]	[illegible]	87	[illegible]	39	[illegible]	[illegible]
WASHAKIE NATIONAL FOREST												
[illegible]	1950	[illegible]	5	1,[illegible]	[illegible]	5	[illegible]	5	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	1946	[illegible]	[illegible]	950	52		[illegible]	[illegible]	[illegible]	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

[illegible] seedlings.

[illegible]

The distribution of [illegible] time [illegible] is given in table No. 4. It is notable that [illegible] man days was spent on preeradication and [illegible] with the Forest Service. 67.5 per cent of the man days [illegible] [illegible].

TABLE NO. 4

ANALYSIS OF RELIEVER TIME, 1937
MEDICINE BOW OPERATION, WYOMING

Time Classification	Man Hours	Man Days*	Per Cent
Ribes eradication	18,951	2,369	63.[illegible]
Ribes eradication (chem.)	62	8	[illegible]
Assisting personnel	3,165	396	10.6
Kitchen	2,965	371	[illegible]
Camp maintenance	[illegible]	[illegible]	[illegible]
Camp wood	756	95	[illegible]
Preeradication survey	[illegible]	239	[illegible]
Contributed (planting)	[illegible]	[illegible]	[illegible]
Totals	29,[illegible]25	3,[illegible]	[illegible]

* Eight hours constitute one man day

Summaries of the 1937 eradication and [illegible] data for 1936-1937 are given in Tables [illegible].

TABLE NO. 5

[illegible]
MEDICINE BOW OPERATION [illegible]

[illegible]	Total Acres	[illegible] Man Days	[illegible]	[illegible]
[illegible]	15,516	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table [illegible]

[illegible]
MEDICINE BOW [illegible]

Eradication Type	Total Acres	Ribes by Species		Total [illegible]
		R. cereum	R. inerme	
Open Pole	9,824	[illegible]	[illegible]	[illegible]
Sage Grass	1,279	30,524	[illegible]	30,846
All [illegible]	11,103	479,524	37,[illegible]	[illegible]
Stream	199	23	69,897	69,920
All Types	11,[illegible]	479,527	[illegible]	[illegible]

DISCUSSION

No ribes-free area was involved in either the 1936 or 1937 working units on the Medicine Bow Forest. The principal type, open pole, has [illegible] concentration of ribes on rocky sites but in general has a light ribes population. The grass-sage type has a scattered ribes population but there is a fairly uniform distribution of bushes. The small amount of stream type is consistently a heavy producer of ribes.

R. cereum is the predominant species accounting for [illegible] per cent [illegible] all bushes in 1936 and 89 per cent in 1937 with a two-year average of 8[illegible] per cent. The percentage of this species however will vary considerably according to the amount of stream type that is worked since the latter supports large amounts of R. inerme only.

In 1937 an average of 9[illegible] bushes of both species per acre were removed while from the adjacent area worked in 1935, 3[illegible] bushes per acre were removed. The heavier ribes population on the 1937 area resulted in an increase in the amount of time required to work an acre from .[illegible] man days per acre in 1935 [illegible] .65 man days in 1937. The percentage increase in this working time is only slightly less than the percentage increase in ribes population.

WYOMING SUMMARY

In 1935 and 1936 ribes eradication work was done on [illegible] acres in the vicinity of Brooks Lake on the Washakie National Forest, Wyoming. [illegible] accounts of this work were given in the 1935 and 1936 annual reports. Combining the data from the Washakie operation with those from the Medicine Bow operation gives a summary of all work performed in Wyoming. Such information is presented in Tables Nos. 10 and 11.

TABLE NO. 10

SUMMARY OF RIBES ERADICATION, 1935-1937
WASHAKIE AND MEDICINE BOW OPERATIONS, WYOMING

Eradication Type	Acres First Working	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Open Pole	11,664	3,963	536,842	.34	46
Dense Mature	6,507	1,140	201,513	.18	31
Burn	619	120	22,738	.19	37
Sage-Grass	1,279	376	30,846	.29	24
Timber line	45	111	41,663	2.47	926
All Upland	20,114	5,710	833,602	.28	[illegible]
Meadow	1,217	0	0	.00	0
Stream	429	1,230	252,169	2.86	588
All Types	21,760	6,940	1,085,771	.32	50

TABLE NO. 11

TOTAL RIBES BY SPECIES ERADICATED 1935-1937
[illegible] AND MEDICINE BOW OPERATIONS, WYOMING

Eradication Type	Acres First Working	Ribes by Species						Total Ribes
		R. mont.	R. cer.	R. iner.	R. lac.	R. vis.	R. lept.	
[illegible]	11 [illegible]	8 [illegible]	[illegible] 040	43,65[illegible]	[illegible]7 [illegible]	16,305	0	[illegible]
[illegible]	6 [illegible]	174,960	0	[illegible]	16,208	[illegible]2	1,505	201,5[illegible]
[illegible]	619	8,[illegible]	[illegible]	[illegible]	3,543	[illegible],36[illegible]	[illegible]	[illegible]
[illegible]	1,279	0	30,524	[illegible]	0	0	0	[illegible]
[illegible]	[illegible]	[illegible]	0	[illegible]	0	0	1,265	[illegible]
[illegible]	[illegible]	[illegible]	279,564	[illegible]	[illegible]	27,405	2,760	[illegible]
[illegible]	1,21[illegible]	[illegible]	0	[illegible]	0	0	0	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] pes	[illegible]	[illegible]2,0[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

by

H. R. Offord, Pathologist, and V. D. Moss, [illegible]

A. [illegible]

At the beginning of the 193[illegible] calendar year, responsibility for conduct of blister rust control in the [illegible] was assigned to regional leaders [illegible] at Spokane, Washington, and [illegible] Oakland, California. The former leader was [illegible] for the [illegible] region (Washington, Idaho, Montana, Wyoming and Colorado) and the [illegible] the sugar pine region (California and Oregon). [illegible] methods of ribes eradication, the continuation of ribes ecology work, [illegible] testing and improving of equipment for both regions were combined into [illegible] activity under the supervision of [illegible] at Berkeley, California. [illegible] the methods work remained on the same [illegible] division of the western work, it was understood that work undertaken in [illegible] separate regions would be planned and [illegible] in close cooperation with the respective regional leaders. Conforming to the intent of the [illegible] scheme, several changes were made in the [illegible] of responsibilities [illegible] personnel of the methods project.

In the northwestern region [illegible] Moss was transferred from [illegible] work to take immediate charge of developmental work in methods of ribes eradication and in ribes ecology. The development of [illegible] methods of ribes eradication and the testing and improvement of equipment, which have for many years been handled out of the Spokane office by [illegible] Breakey, were [illegible] catalogued as activities of the methods project with the understanding that Breakey would continue to work under the direction of the [illegible] for the [illegible] western region. Miss Ryan was transferred from the Oakland to the [illegible] office to take care of stenographic and [illegible] work. All [illegible] pertaining to the management of the methods project were to be handled [illegible] the Oakland office. The following people are now being paid out of [illegible] funds allotted to the methods project: At Berkeley, California [illegible] C. R. Quick, Catherine Ryan, and [illegible] at Spokane, Washington [illegible] Breakey and V. D. Moss.

For the first time, the annual report on methods [illegible] is presented separately for the two regions. This report covers methods [illegible] tests and ribes ecology work undertaken in the [illegible] Colorado and Wyoming) for the calendar year of 193[illegible]. [illegible] under the following section headings: A. Introduction, B. [illegible] chemical plot work, C. Chemical plot work for 193[illegible], D. [illegible] use of chemicals in ribes eradication, E. [illegible] November 1938 April 1937, F. Establishment of [illegible] growth and regeneration of ribes in [illegible] type areas of the [illegible] G. Future ecological work in the Inland Empire.

[illegible]

Inland Empire and Western Washington

The 1936 decapitation and methods test plots on the [illegible] and Clearwater National Forests were checked by Moss and Barrett during [illegible] period June 10 to June 20. Reference should be made to Tables 12, 13 and [illegible] and pages 288, 289, 292, and 293 of the 1936 annual report for details and descriptions of the work performed on each forest. Results have been [illegible] good with all chemicals tested in the decapitation and treatment of R. [illegible]simum bushes over the last two-year period. Data from the north Idaho deca[illegible]tion plots have been summarized in Tables 1, 2, 3, and 4 to show the [illegible] results of the various chemicals tested, and methods of treatment for the [illegible] and 1936 seasons.

The average bush kill with all chemicals for one ounce dosages [illegible] over was 97.8 percent. The difference in percent bush kill for all chem[illegible] tested varies but slightly; therefore, the choice of any one chemical mu[illegible] based upon its field practicability and relative cost to the job. It is [illegible]parent that so far the results of the tests fully justify the present recom[illegible]mendations for regular eradication work in the decapitation and chemical treatment of large or difficult R. viscosissimum bushes. To ensure gr[illegible] effectiveness from the chemical treatment a low cut should be made on the [illegible] crown. A low cut renders the ribes crown more susceptible to chemical [illegible] and the lower this cut is made the greater are the chances of obtaining a [illegible] even allowing for possible mistakes in the application of the chemical.

It is interesting to note that for all low cut control bushes 74.[illegible] percent kill was obtained as compared with 44.8 percent for all high cut contr[illegible] Data from the results of various decapitation experiments without chemical treatment have shown that the mortality rate increases as the cut is lowered [illegible] the ribes crown. Decapitation tests conducted by F. O. Walters on [illegible] plots in the Kaniksu National Forest showed that by decapitating the [illegible] below the crown with a Pulaski tool better than 99 percent bush kill [illegible] This work was done in 1936. With this method the man days per acre [illegible] concentrations of R. viscosissimum bushes were reduced one half as [illegible] former hand pulling and grubbing methods. Operation supervisors [illegible] use this method of eradicating R. viscosissimum whenever extra heavy concentra[illegible]tions of upland ribes are encountered. Since these heavily populated areas cannot be placed on a maintenance basis with one working, the time saved by [illegible] low decapitation technic in the preliminary working would justify a [illegible] lower bush efficiency. Actually the results of [illegible] and the methods results shown in Table 5 both indicate that [illegible] closely comparable to that of regular grubbing and pulling work; thus there appears to be no reason why the faster technic should not be used. [illegible] further large scale trials should be undertaken. Chemical treatment of [illegible]ted crowns should supplement hand pulling and the decapitation of [illegible] crown wherever large or difficult R. viscosissimum bushes are [illegible] [illegible] bushes are those that arise from beneath windfalls, logs, rocks, [illegible] rooted in rock crevices or intertwined with the roots of heavy brush [illegible]

TABLE NO. [illegible]

RECAPITULATION AND ANALYSIS OF DATA FROM 1935 AND 1936 [illegible]
DECAPITATION PLOTS ON RIBES VISCOSISSIMUM

Treatment	Number of Bushes	Percent of Bushes Killed
Diesel oil	509	99.[illegible]
Common salt	67	100.0
Borax	262	95.[illegible]
Sodium chlorate and borax	943	99.[illegible]
Ammonium thiocyanate and its mixtures	1,418	98.[illegible]
All bushes treated with 1 ounce or more of chemical	2,314	97.8
All low cut bushes (treated with chemical)	2,[illegible]99	98.8
All low cut controls	300	74.[illegible]
All high cut bushes (treated with chemical)	1,003	97.1
All high cut controls	146	44.[illegible]
All plots and all dosages	3,202	98.[illegible]

The 1936 decapitation tests showed that 4 11 cc. of saturated [illegible] solution of ammonium thiocyanate was equally as effective as the 1 to 3 [illegible] dosages of the sodium chlorate and borax mixture. For an average size [illegible] of R. viscosissimum the lethal dosage of saturated aqueous thiocyanate [illegible] about one half tablespoon of the fluid. On this basis a pint of chemical [illegible] tion would enable a man to treat about thirty ribes crowns. The use of small quantities of saturated aqueous ammonium thiocyanate thus offers excellent [illegible] portunity to extend the scope of the chemical treatment of decapitated [illegible]

On June 12, the results from the decapitation controls on the [illegible] Pass plots, Kaniksu National Forest, showed 88.4 and 77.3 or an average of [illegible] percent bush kill for low cut crowns. These data are shown in Table [illegible]. The same plots were rechecked August 24 and on plot 7 three crowns were found dead that had been developing resprouts June 12; three crowns that were reported as dead and showing no resprouts June 12 were alive August 24. Thus, the percent bush kill remained the same for this plot. On plot 7A one crown that was reported alive June 12 was dead August 24, while three crowns that [illegible] as being dead June 12 were alive August 24. The death of these [illegible] explained by the drying out of crown tissue, resulting in a shortage of [illegible] and available food for the new growth.

Various methods of eradicating R. viscosissimum were [illegible] Ikes Creek area in the St. Joe National Forest. The results of these [illegible] given in Table 5. The differences in percent bush kill [illegible] the four methods tested. Decapitation of R. viscosissimum bushes below the crown with the pruning shears was 41 percent faster per unit of ground than the hand pulling and grubbing method of eradication. Decapitating below the crown with the Pulaski tool was 39.[illegible] percent faster than hand pulling and

[illegible] than the [illegible] method. There are [illegible] to all these methods [illegible] is being considered a single method for eradication. On the basis of [illegible] available field tests, the best procedure would be one involving hand [illegible] small bushes, decapitating below the crown with the Pulaski tool large [illegible] some bushes that are readily accessible, and chemically treating all [illegible] ribes crowns that are hard to reach.

Chemical spray tests using Atlacide at the rate of [illegible].4 pounds per gallon of solution on R. laxiflorum showed unfavorable results with the [illegible] of the test in which a 2,240 pound dosage per acre was applied on a low [illegible] plot. This work was undertaken on the Spruce Lake area, Kootenai National [illegible] Montana. Reference should be made to pages 289-291 of the 1936 annual report [illegible] description of the plot sites and work performed. The results of the tests [illegible] given in Table 6 of this report.

TABLE NO. 2

RECAPITULATION AND ANALYSIS OF DATA FROM 1936 IDAHO DECAPITATION PLOTS ON RIBES VISCOSISSIMUM

Treatment	Type of Cut	Quantity of Chemical Per Crown	Number Bushes Treated	Percent [illegible]
Borax	Low	1 oz.	122	[illegible]
"	High	1 oz.	50	[illegible]
"	High	2 oz.	90	[illegible]
Sodium chlorate and borax (1:5)	Low	1 oz.	123	[illegible]
" "	High	1 oz.	50	100.0
" "	High	2 oz.	76	[illegible]
Ammonium thiocyanate (sat.)	Low	4 cc.	40	100.0
" "	Low	5.4 cc.	50	[illegible]
" "	Low	8 cc.	32	[illegible]
" "	Low	11 cc.	50	100.0
Controls	Low		139	[illegible]
"	High		35	[illegible]
All borax treated bushes	H & L	1-2 oz.	262	[illegible]
All chlorate and borax treated bushes	H & L	1-2 oz.	249	90.3
All ammonium thiocyanate treated bushes	H & L	4-11 cc.	172	[illegible]
All controls	H & L		[illegible]	[illegible]

L - Low cut, through crown.
H - High cut, above crown.

TABLE NO. [illegible]

RESULTS OF 1936 DECAPITATION TESTS ON R. VISCOSISSIMUM
PYRAMID PASS AREA, KANIKSU NATIONAL FOREST, IDAHO

Plot No.	Chemical Used	Type of Cut	Quantity of Chemical Per Crown	No. of Bushes Treated	[illegible]
1	Borax	Low	1 oz.	50	100
2	"	High	1 oz.	50	94
3	Sodium chlorate + borax (1:5)	Low	1 oz.	50	100
4	" "	High	1 oz.	50	100
5	Ammonium thiocyanate (sat.)	Low	11.0 cc.	50	100
6	" "	Low	5.4 cc.	50	98
7	Controls	Low		78	68 [illegible]
7A	"	Low		22	[illegible]

a = Check made June 12.
b = Recheck made August 24.

TABLE NO. 4

RESULTS OF 1936 DECAPITATION TESTS ON R. VISCOSISSIMUM
OROFINO CREEK AREA, CLEARWATER NATIONAL FOREST, IDAHO

Plot No.	Chemical Used	Type of Cut	Quantity of Chemical Per Crown	Treated Bushes		[illegible]	
				No. Bushes	Percent Bushes Killed	No. Bushes	[illegible]
1	Sodium chlorate + borax (1:5)	High	2 oz.	47	100.0	[illegible]	[illegible]
2	Borax	High	[illegible]	53	[illegible]	[illegible]	[illegible]
3	"	Low	1 oz.	[illegible]	[illegible]	14	[illegible]
4	Sodium chlorate + borax (1:5)	Low	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	" "	High	[illegible]	29	96.2	[illegible]	[illegible]
6	Borax	High	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	Ammonium thiocyanate (sat.)	Low	4 cc.	40	[illegible]	[illegible]	[illegible]
8	" "	Low	8 cc.	[illegible]	[illegible]	[illegible]	[illegible]

TABLE NO. 5

RESULTS OF 1936 METHODS TESTS ON R. VISCOSISSIMUM [illegible] CREEK [illegible]
ST. JOE NATIONAL FOREST, IDAHO

Plot[a] No.	Method of Eradication	No. of Large Bushes on Plot	No. of Bushes Treated With Chemical	Total No. of Bushes on Plot	Total Elapsed Time required for Eradication Work	No. of Bushes Eradicated Per [illegible]	[illegible]
1	Hand pulled and grubbed	36		1,178	9 hrs. & 50 min.	[illegible]	[illegible]
2	Decapitated below crown with a Pulaski	21		932	5 hrs. & 30 min.	[illegible]	[illegible]
3	Decapitated below crown with pruning shears	26		923	4 hrs. & 50 min.	[illegible]	[illegible]
4	Small bushes hand pulled or grubbed. Troublesome bushes decapitated and chemically treated	49	80[b]	1,116	8 hrs. & 40 min.	[illegible]	[illegible]

[a]Each plot 1/4 acre.
[b]Includes the 49 large bushes. Additional 31 bushes were troublesome because of location or rooting habit.

TABLE NO. 6

RESULTS OF CHEMICAL SPRAY TESTS WITH ATLACIDE ON R. [illegible]
SPRUCE LAKE AREA, KOOTENAI NATIONAL FOREST, MONTANA

Plot[a] No.	Site Characteristics	Gallons Solution Per Acre	Pounds Chemical Per Acre	Percent Bushes Killed
1	Steep, well drained	480	672	[illegible]
2	" "	960	1,344	[illegible]
3	" "	1,600	2,240	[illegible]
4	Flat, swampy	480	672	[illegible]
5	"	960	1,344	[illegible]
6	"	1,600	2,240	[illegible]

[a]All plots 1 sq. rod in size. Chemical solution applied with knapsack sprayer

During the period June [illegible] to June 7, [illegible] and [illegible] checked the Ribes bracteosum chemical plots on Buck Creek, Snoqualmie National Forest, Washington. The experimental area adjoins Mount Rainier National Park.

In discussing, early last summer, the objectives of these tests, the National Park Service officials pointed out the importance of removing all evidence of chemical work, and of reducing the amount of digging and ground disturbance to a minimum. Experiments therefore were designed with these thoughts primarily in mind. For example, broadcast applications were made at a [illegible] rate over the square rod plots after slashing and removal of all ribes and [illegible]. In practice, of course, vegetation other than ribes would be left undisturbed, but to facilitate even application of the chemical in the present dosage [illegible] all brush was cut down to within a foot of the ground surface. Aqueous Atlacide and sodium thiocyanate were used in the broadcast applications (Table 7) and [illegible] sodium thiocyanate was employed in the decapitation tests (Table 8).

Of the broadcast treatments, the 10 and 15-pound per square rod dosages of Atlacide were the only ones to provide satisfactory bush kill. In plots 5 and 6, eight and nine feet, respectively, of live stem were found [illegible] year at the time of check. The lethal dosages appear to be too high to warrant the use of the broadcast method for regular crew work.

The decapitation method, however, appears to have definite possibilities for crew use. In the low cut tests, as shown in Table 8, 93 percent of the treated bushes were killed, while 71 percent bush kill was obtained from the high cut treatments. A low cut appears to be necessary for effective results from the chemical treatment.

Later in the summer Moss made a demonstration of the proposed decapitation and ammonium thiocyanate treatment of R. bracteosum crowns to National Park Service officials and to crews from a CCC camp in Mount Rainier National Park. The procedure involved grubbing and digging of all small plants [illegible] lateral root centers of large clumps, and the decapitation and treatment of the large central root crown with a saturated solution of ammonium thiocyanate. Supervisors and crewmen were enthusiastic about the new method and [illegible] big crowns could be handled many times more quickly by chemical treatment than by grubbing. The Mount Rainier National Park supervisors, however, were [illegible] by their Washington superiors to discontinue chemical work in the Park until the poison hazards of ammonium thiocyanate to wild life had been conclusively established.

TABLE NO. [illegible]

RESULTS OF 1936 SOIL DRENCH TESTS ON R. [illegible]
SNOQUALMIE NATIONAL FOREST, WASHINGTON

Plot No.	Date of Treatment	Chemical Used	Dosage Per Acre		Ribes Present on Treated Plots After [illegible]	
			Pounds	Gallons Solution	Ft. Live Stem	No. [illegible]
1	8/28	Atlacide	480	800	[illegible]	
2	8/28	"	800	800	[illegible]	
3	8/28	"	1 120	800	54	
4	8/28	"	1 600	[illegible]	8	
5	8/28	"	2 400	[illegible]	9	
6	8/29	Sodium thiocyanate	480	1 600	213	
7	8/29	" "	800	1 600	[illegible]	
8	8/29	" "	1 120	[illegible]	32	
9	8/29	" "	1 600	[illegible]	[illegible]	
10	8/29	" "	2 400	1 600	[illegible]	

All plots were 16-1/2 ft. x 16-1/2 ft. Plots 1-5 were treated [illegible] the standard blister rust 5-gallon knapsack sprayer. Plots 6-10 [illegible] by sprinkling chemical solution from a watering can.

TABLE NO. 2

RESULTS OF 1936 DECAPITATION TESTS[a] ON R. BRACTEOSUM [illegible]
SNOQUALMIE NATIONAL FOREST, WASHINGTON

Plot No.	Chemical Used	Number of Crowns Treated	Number of Dead Crowns in 1937	Percent of Crowns Killed
1[b]	Sodium thiocyanate	28	[illegible]	[illegible]
2[c]	" "	27	25	[illegible]

[a]All treatments made on August 31, 1936.
[b]High cut crowns, i.e., cut made several inches above the crown leaving short stubs of stems.
[c]Low cut crowns, i.e., cut made at ground level or through upper portion of the crown.

Colorado and Wyoming

The 1936 plot tests and the decapitation and oiling work done by regular eradication crews in Colorado were checked by Joy, Chapman, [illegible] and Offord during the period August 25-29. The decapitation and oiling of large *R. cereum* crowns resulted in 100 percent bush kill on the plot treated by Joy and Offord (see note b in Table 9). The same type of work under [illegible] WPA crews during July of 1936 also resulted in a satisfactory kill. The area worked by these regular crews contained several hundred large *R. cereum* [illegible] mostly of the rock type. A random check of this area made in August 1936 by Joy, Chapman, Thompson, and Offord showed only two live crowns.

The Atlacide soil drench tests on *R. inerme* (Table 9) showed that too much chemical would be required to be practical for use in regular eradication work. The results of this work confirmed previous tests on *R. inerme* [illegible] in Idaho and California. Under rocky conditions where the chemical would be most useful, the bush kill, as shown by data on plots 5 and 6, was below the standards acceptable for crew work. The eradication of *R. inerme* from [illegible] slopes in Colorado and in Wyoming is expensive work. Furthermore, hand [illegible] in these areas have not been very effective; the crowns break off readily and later resprout vigorously. It is recommended therefore that additional [illegible] tests be made on the rock type *R. inerme*. The new oil formula of Diesel oil plus furfural saturated with ammonium thiocyanate may be more effective than the chlorate compounds.

TABLE NO. 9

RESULTS OF 1936 ATLACIDE TESTS[a] ON R. INERME, [illegible] AREA[b] BELOW CLYDE, COLORADO, PIKE NATIONAL FOREST

Plot No.	Date of Treatment	Dosage Applied Per Sq. Rod		Effectiveness of Treatment	
		Pounds	Gallons	No. of Live Crowns	No. of Dead Crowns
1	6/24	20	12	4	27
2	6/24	16	16	1	44
3	6/24	10	2	21	56
4	6/24	8	8	30	55
5	July	18	12	14	42
6	July	12	10	17	36
7	July	3	2	44	93

[a] Square rod plots on which *R. inerme* was clipped at ground level, the aerial plant parts being thrown off the plot area, and the ground drenched with Atlacide solution at the uniform dosage rate. Plots 5, 6, and 7 treated by WPA workers under supervision of assistant camp boss. Plots 1, 2, 3, and 4 treated by Joy and Offord with WPA labor.

[b] A 1936 decapitation test on *R. cereum* involving [illegible] of crowns showed 100% bush kill. The oil formula used was Diesel oil 32° [illegible] 4 parts + crankcase oil 1 part. There were eleven large rock-bound *R. cereum* bushes on the plot. Dosages varied from 1/5 to 1/3 of a gallon per crown.

[illegible]

Inland Empire and Western Washington

Sodium ethyl xanthate was suggested to this Bureau as a possible herbicide for ribes. Two series of plots were established on the St. Joe National Forest in which this chemical was applied as a combination spray and soil drench to *R. petiolare*. The two areas represented distinct and different site conditions, the Crystal Creek plots being so swampy that many ribes root systems were partially submerged, while those on the St. Maries River were well drained and better than two chains from surface water. Details of these tests are given in Table 10. The results of these applications will be compared with Atlacide tests on *R. petiolare*.

Chemical spray tests were also completed on *R. inerme* to determine the comparative effectiveness of sodium ethyl xanthate, Diesel oil and a mixture of Diesel oil + furfural saturated with ammonium thiocyanate. Diesel oil is considered highly satisfactory because of its low cost and ease [illegible] in handling. Its herbicidal effectiveness has been relatively good with high dosages in former tests. Greenhouse tests at Berkeley have recently shown that the toxicity of Diesel oil was increased by mixing with it a solution of furfural saturated with ammonium thiocyanate. Details of the field tests are presented in Table 11. Each square rod plot was divided into four equal parts to facilitate uniform application of the chemical solution.

TABLE NO. [illegible]

1937 SODIUM ETHYL XANTHATE SPRAY TESTS ON R. PETIOLARE
ST. JOE NATIONAL FOREST, IDAHO

Location	Plot[a] No.	Gallons Solution Per Acre	Pounds Chemical Per Acre	Date of Treatment
Crystal Creek	1	800	800	7/23
	2	1,120	1,120	7/23
	3	1,600	1,600	7/23
St. Maries River	1	800	800	7/19
	2	1,120	1,120	7/19
	3	1,600	1,600	7/19

[a]All plots 1 square rod in size.

[illegible]

CHEMICAL SPRAY TESTS ON R. INERME, KANIKSU, COEUR D'ALENE AND ST. JOE NATIONAL FORESTS

Plot[a] No.	Treatment	Quantity Chemical Used Per Acre	Date of Treatment: Kaniksu	Coeur d'Alene	[illegible]
1	Diesel oil	480 gals	8/5	7/29	[illegible]
2	"	800 "	8/5	7/29	[illegible]
3	"	1,120 "	8/5	7/29	[illegible]
4	"	1,600 "	8/5	7/29	[illegible]
5	Diesel oil + furfural sat. with ammonium thio.[b] (3:1)	480 "	8/5	7/29	[illegible]
6	" " (5:1)	800 "	8/5	7/29	8/11
7	" " (7:1)	1,120 "	8/5	7/29	8/11
8	" " (10:1)	1,600 "	8/5	7/29	8/11
9	Sodium ethyl xanthate	480 lbs.	8/6	7/30	
10	" "	800 "	8/6	7/30	
11	" "	1,120 "	8/6	7/30	
12	" "	1,600 "	8/6	7/30	

[a] All plots 1 sq. rod in size. Chemical applied as an aerial spray and [illegible] crown drench with the knapsack sprayer.

[b] Furfural saturated with ammonium thiocyanate and mixed with Diesel oil in the volume ratio of Diesel oil to the mixture as shown.

Atlacide, the most effective chemical on R. petiolare, so far has proven to be of low toxicity on R. triste. At the suggestion of H. C. Hartman a series of chemical spray tests on R. triste was established, using Diesel oil and Diesel oil + furfural saturated with ammonium thiocyanate. The same proportional mixtures were used as outlined for the R. inerme tests. Details of this work are presented in Table 12.

A series of decapitation test areas on R. viscosissimum were established on the four north Idaho forests. Details of these tests are presented in Table 13. On plot 1, the treatment undertaken was a duplication of the experiments conducted by F. O. Walters where the ribes bushes were decapitated below the crown with a Pulaski tool. On plots 2 and 3 ribes bushes were decapitated through the crown, plot 3 receiving in addition chemical treatment. A special syringe has been developed for the application of the saturated aqueous solution of ammonium thiocyanate to the ribes crown. This syringe is tightly fitted into the top of a 2-quart water canteen and carried on the crewman's back or side by shoulder straps. A canteen of solution would be sufficient to treat [illegible] ribes crowns. Each crown treated received from 2 to 8 cc. of solution, the quantity depending upon the size of crown tissue to be covered. The Kaniksu plots are located at Pyramid Pass, the Coeur d'Alene series on [illegible], the St. Joe series on the Elk Creek drainage, and the Clearwater plots at the [illegible] of Hemlock Creek.

TABLE NO. [illegible]

1937 CHEMICAL [illegible] TESTS ON R. [illegible], ST. [illegible]
IDAHO - NORTON CREEK AREA

Plot[a] No.	Chemical Used	Gals. of Solution Per Acre	Date of Treatment
1	Diesel oil	480	9/16
2	"	800	9/16
3	"	1,120	9/16
4	"	1,600	9/16
5	Diesel oil + furfural sat. with ammonium thiocyanate[b] (3:1)	480	9/17
6	" " (5:1)	800	9/17
7	" " (7:1)	1,120	9/17
8	" " (10:1)	1,600	9/17

[a]All plots 1 sq. rod in size.
[b]Furfural saturated with ammonium thiocyanate and mixed with Diesel oil in the volume ratio of Diesel oil to the mixture as shown.

TABLE NO. 13

1937 DECAPITATION PLOTS ON R. [illegible], [illegible]
ST. JOE, AND CLEARWATER NATIONAL [illegible], IDAHO

Plot No	Treatment[a]	No. of Bushes	Date of Treatment			
			Kaniksu	[illegible]	[illegible]	[illegible]
1	Decapitated below crown	50	8/24	[illegible]	[illegible]	[illegible]
2	Decapitated through crown	50	8/24	8/12	[illegible]	[illegible]
3	Decapitated through crown and chemically treated[b]	50	8/24	8/13	9/13	[illegible]

[a]Pulaski tool used in decapitation work.
[b]2-5 cc. saturated aqueous solution of [illegible] used for [illegible] treatment of ribes crowns.

Colorado and Wyoming

The 1937 plot tests on R. cereum and R. montigenum in Colorado and Wyoming included tests with sodium ethyl xanthate, Diesel oil, Diesel oil plus crankcase oil, and Diesel oil plus crankcase plus furfural [illegible] ammonium thiocyanate. This work, undertaken by Joy, Offord and Chamberlin [illegible] or more WPA assistants, is summarized in Tables 14 and 15. Several [illegible] tests were undertaken in Colorado and Wyoming with WPA labor supervised by camp bosses Thompson and Hirst. Diesel oil, Atlacide, and common salt were tested as shown in Table 16.

The 1937 tests on plots 1, 2, 3, 4, and 5 (Table 14) were made [illegible] portion of the area which had been treated with oil late in October of 193[illegible]. When the 1937 plots were being established in the Bison Creek area, it was [illegible] that many more R. montigenum bushes appeared to be dead in 1937 than were [illegible] dead by the data taken the previous year. In order to establish the [illegible] this observation a complete check was made of the 1935 work. Subsequently several of the 1935 oil plots from other areas were checked to determine [illegible] additional kill, if any, had occurred during the past year. Data summarized in Table 17 clearly show that there has been delayed killing of both R. montigenum and R. cereum after treatment of the intact bushes with Diesel oil, [illegible] especially following treatment with the combination of crankcase oil and Diesel [illegible].

The tests conducted in 1937, as summarized in Tables 14, 15, [illegible] should furnish confirmation of the effectiveness of the oils and [illegible] strate whether or not they can be used in large scale eradication work.

Plot No.[a] and Location	Date of Treatment	Chemical Used	Dosage in Gals Per Acre	No. of Crowns	Feet Live Stem	Crown Area Treated in Sq. Ft.	[illegible]
Upper Middle Beaver Divide 1	8/26	Diesel oil 32° Be + CCO[b]	[illegible]	[illegible]	16,220	1,460	[illegible]
2	8/26	(Diesel oil + CCO) 5 parts + (furfural sat. with NH_4CNS) 1 part	[illegible]	1,200	[illegible]	[illegible]	[illegible]
3	8/26	Diesel oil + CCO	[illegible]	600	[illegible]	[illegible]	[illegible]
4	8/26	(Diesel oil + CCO) 5 parts + (furfural sat. with NH_4CNS) 1 part	5,000	[illegible]	[illegible]	[illegible]	[illegible]
5	8/26	Diesel oil 32° Be	5,000	500	[illegible]	[illegible]	[illegible]
Lower Middle Beaver 1	8/27	Sodium ethyl xanthate (1 lb per gal. of soln.)	1 pint to 1 gal per crown[d]	[illegible]			

[a]Plots 1, 2, 3, and 4 were 1 sq. chain each; plot 5 [illegible]

[b]CCO signifies crankcase oil mixed in ratio of 1 part to [illegible] of Diesel oil.

[c]Applied as a combined aerial spray and [illegible] on upper Middle Beaver plots; [illegible] on lower Middle Beaver plot.

[d]Details of treatment for each crown are [illegible]

TABLE NO. [illegible]

[illegible] DECAPITATION TESTS ON [illegible], [illegible] LARAMIE, WYOMING

Plot No and Location		Date of Treatment[a]	Chemical Used	Dosage In Gals Applied Per Crown[b]	[illegible]
1/2 mile west[e] Pole Mt.	1	9/1	(Diesel oil 32° Be 4 parts + crankcase oil, 1 part) 5 parts + (furfural sat with NH_4CNS) 1 part	0.1 - [illegible]	
	2	9/1	(Diesel oil 32° Be) 4 parts +(crankcase oil) 1 part	[illegible]	
	3	9/2	(Diesel oil 32° Be) 1 part + (crankcase oil) 1 part	0.1 - [illegible]	
	4	9/2	Diesel oil 32° [illegible]	0.1 - [illegible]	
1.5 miles east Camp [illegible]	5	9/9	Diesel oil 32° [illegible]	0.1 - [illegible]	
Crew Division #13	6	9/10	Diesel oil 32° [illegible]	[illegible]	

[a] Bushes decapitated with pruning shears; oil [illegible] back tanks and applied by watering [illegible].
[b] Dosage records for individual crowns available from [illegible].
[c] Bush #326 treated with 2 ounces dry [illegible].
[d] Applied to sprouting crowns [illegible] grubbing. Sprouts were not cut off.
[e] Along old Pole Mt. road, [illegible]

SUMMARY OF 193? [illegible]

[illegible]

Date of Work	Location of Work	Chemical Used and Method of Treatment	Acre-age Work-ed	[illegible]	[illegible]
9/2-3	Colorado Camp C-1 Working unit 1; T. 15 S., R. 68 W., Sec. 5 Bison Creek Pike N. F.	Diesel oil Spray and soil drench of intact bushes	[illegible]	[illegible]	[illegible]
9/3 and 9/12	Colorado Camp C-1 Working unit 1, T. 15 S., R. 68 W., Sec. 5 Bison Creek Pike N. F.	Atlacide (2# per gal. water) Spray and soil drench of intact bushes	[illegible]	[illegible]	[illegible]
9/13	Colorado Camp C-1 Working unit 1; T. 15 S., R. 68 W., Sec 10, Middle Beaver Creek Pike N. F.	Atlacide (2# per gal water) spray. Rework of area worked in 1935 by hand	[illegible]	[illegible]	
9/17	Wyoming Camp W-2 Working unit 1; T. 14 N., R. 71 W., Sec. 17 Pole Mt. area Medicine Bow N. F.	Diesel oil on decapitated bushes	[illegible]	[illegible]	[illegible]
9/16	Wyoming Camp W-2 Working unit 1; T. 15 N., R. 72 W., Sec. 26 Pole Mt. area Medicine Bow N. F.	Diesel oil rework applied to sprouting crowns as a drench	[illegible]	[illegible]	[illegible]
10/2?	Wyoming Camp W-2 Working unit 1; T. 14 N., R. 71 W., Sec. 17 Pole Mt. area Medicine Bow N. F.	Sodium chlorate (2# per gal. water) spray on intact bushes	[illegible]	[illegible]	
10/2?	Wyoming Camp W-2 Working unit 1; T. 15 N., R. 72 W., Sec. 25 Pole Mt. area Medicine Bow N. F.	Atlacide (2# per gal. water) spray of intact bushes			

[illegible]

[illegible]
[illegible]
[illegible]

Plot No.	Species Treated	Number Bushes Treated	Gals. Oil Per Bush (Average)	Percent [illegible] 193[illegible] Check	193[illegible] [illegible]
4[a]	R. montigenum	9	0.[illegible]	[illegible]	[illegible]
1[b]	"	27	[illegible]	[illegible]	[illegible]
2[c]	"	153	[illegible]	[illegible]	[illegible]
7[d]	R. cereum	20	[illegible]	[illegible]	[illegible]

[a] On Middle [illegible] [illegible] applied as a crown drench [illegible] bushes.
[b] On Bison Creek. Diesel oil [illegible] crankcase oil [illegible] applied as a crown drench [illegible] bushes.
[c] On Bison Creek. Diesel oil [illegible] applied as a spray and [illegible]
[d] On [illegible] highway. [illegible] drench to intact bushes.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] (large clumps). Decapitate the large central crown [illegible] and [illegible] the exposed crown tissue and the soil [illegible] the crown with a saturated aqueous solution of ammonium [illegible]. [illegible] amounts to a dosage of about 1/4 pint of the aqueous solution [illegible] crown.

R. cereum (Colorado and Wyoming) - Decapitate large bushes [illegible] at ground level or as close to rock crevice as possible. Then drench [illegible] and soil about the crown with Diesel oil 29° Bé (4 parts) + crankcase [illegible] at the rate of 1/3 gallon of the mixture per average large clump. [illegible] crown can be thoroughly exposed, dosage can be limited to sufficient [illegible] coverage of the crown. Where the cut cannot be made close to the crown [illegible] of rooting habit in a rock crevice, surplus oil must be used. In [illegible] dosage has varied from 1/20 to 1 gallon, depending upon the size and [illegible] the crown.

R. montigenum (Colorado and Wyoming) - Apply Atlacide [illegible] gallon of water at the rate of 1/5 gallon per square yard of ground [illegible] bination aerial spray and soil drench. Methods and dosage are [illegible] same as for work on R. petiolare. As a result of 1937 tests, it may [illegible] to recommend Diesel oil or a mixture of Diesel oil and [illegible] oil [illegible] eradication of R. montigenum. The oil mixtures would be safer than [illegible] work under dry upland conditions, especially in areas where there [illegible] forest litter on the ground.

D. LABORATORY AND GREENHOUSE WORK, NOVEMBER 1936-APRIL [illegible]

Because of Van Atta's resignation from methods work [illegible] of the present year, and the temporary termination of work at the [illegible] ratory, the amount of investigative work completed was very small. [illegible] and greenhouse work undertaken at Berkeley, California during the [illegible] 1936-1937 included: (a) Testing of new ribicides (Offord); (b) [illegible] ribes seed germination tests (Quick); (c) Testing of the effect of [illegible] sodium chlorate, sodium chlorate + borax, and borax alone on the [illegible] ribes seeds (Offord).

A new ribicide consisting of a mixture of Diesel oil [illegible] saturated with ammonium thiocyanate was tested by application to [illegible] plants. For work under wet soil conditions [illegible] favorably with Diesel oil that an application was [illegible] for a [illegible] patent on the mixture.

The results of seed germination tests [illegible] behind the time at which cultures are prepared. [illegible] report [illegible] Quick last winter on his seed germination work [illegible] No. 92) [illegible] done during 1935-1936. Reference should be made to [illegible] report [illegible] a summary of the work done.

Soil sterilization tests with respect to ribes seed [illegible] incomplete and no data have as yet been filed.

[illegible]

(1) Serial No. 8[illegible] "The Use of Chemicals to Aid in the Burning of [illegible]". H. R. Offord and [illegible] d'Urbal.

(2) Serial No. 85 "Field Trials of Eradication Methods Performed on the Stanislaus National Forest from June 16 to August 3, 1936". G. [illegible]

(3) Serial No. 86 "Field Trials of Eradication Methods Performed on the Sierra National Forest from September 17 to September 26, 1936". [illegible] report). G. R. Van Atta.

(4) Serial No. 87 "Field Trials of Eradication Methods Performed in Cal[illegible] during 1936", (a summary). G. R. Van Atta.

(5) Serial No. 88 "Chemical and Mechanical Methods of Ribes [illegible] White Pine Regions of Western United States". H. R. Offord, G. R. [illegible] and H. E. Swanson.

(6) Serial No. 89 "Notes on Some Ribes of California". [illegible]

(7) Serial No. 90 "Variation in Length of Day". [illegible]

(8) Serial No. 91 "Rate of Penetration and Absorption of Diesel Oil in [illegible] White Pine Type Soils". H. R. Offord and [illegible] d'Urbal.

(9) Serial No. 92 "Studies in the Germination of Ribes Seeds [illegible] 1935-1936". C. R. Quick.

Papers published during 1937 include:

(1) "Methods of Propagating Ribes in Nutrient Solution [illegible]" H. R. Offord, G. R. Van Atta, and C. R. Quick. U. S. Dept. of Agri[illegible] Bureau of Ent. and Plant Quar., Mimeographed Series [illegible]

(2) "The Use of Chemicals in Brush Burning". H. R. Offord and [illegible] Jour. For. Vol. XXXV, No. 1[illegible], Oct. 1937, [illegible]

[illegible]

[illegible] studies [illegible] previously [illegible] to [illegible] to determine the relationship existing between ribes and the [illegible] changes brought about by the various methods of logging, [illegible] eradication work and any other factors [illegible] tend to disrupt [illegible]. These studies have not attempted to answer entirely the many [illegible] fronting the blister rust program but to point the need for more [illegible] future investigative work. The effects of the various types of logging [illegible] slash burning of timbered areas on the germination and growth of ribes [illegible] and on white pine reproduction have been studied to some extent by [illegible] Waters. A report of his work is on file at the Spokane office. A [illegible] growth and regeneration of ribes in stream type was conducted by [illegible] during the years 1929-1934, inclusive. This work was continued in [illegible] methods unit. The results of this work which involved restaking and [illegible] of all plots are given in section G of this report.

The purpose of the ecological studies started in 19[illegible] was [illegible] in what numbers and for how long ribes seedlings will continue to [illegible] following eradication work in stream type.

The first group of seedling occurrence plots established [illegible] located on the Swauk Creek chemical plots, Wenatchee National Forest. [illegible] No. 18 shows the number of seedlings [illegible], year of origin [illegible] treatment that these plots received in [illegible]. The peak of seedling [illegible] came the year following treatment, and since then these areas have [illegible] with a dense growth of various species of grasses. It is believed [illegible] majority of seedlings now appearing on these chemically treated [illegible] from seed carried downstream by high water. There are heavy [illegible] growing approximately one-quarter mile upstream. These plots will be [illegible] yearly to determine in what numbers and for how long the seedlings will [illegible] to appear. Data will also be taken on the origin of [illegible] seed.

A second group of seedling occurrence plots was [illegible] Coeur d'Alene and St. Joe National Forests to determine for how long [illegible] what numbers ribes seedlings will continue to [illegible] on [illegible] have been chemically treated and hand pulled and on areas [illegible] ated by the bulldozing method. Table [illegible] following eradication, drainage, [illegible] and [illegible]. [illegible] will receive an annual inspection.

TABLE NO. 18

SEEDLING OCCURRENCE FOLLOWING 1932 CHEMICAL TREATMENT ON SWAUK CREEK PLOTS, WENATCHEE NATIONAL FOREST, WASHINGTON

Plot[a] No.	Chemical Used	Pounds Per Acre	Treatment[b]	R. inerme Seedlings Per Acre and Year of Origin 1937	1936	1935	1934	Total Per Acre
1(18)	Sodium arsenite	5,000	Subsurface drench	2,720	1,600	800		5,120
2(19)	Ammonium thiocyanate	5,000	Surface and soil drench	480	640	800	640	2,560
3(9)	Sodium chlorate	5,000	" "	320	640	320		1,280
4(27)	" "	5,000	" "		960	640		1,600
5(26)	" "	14,000	Subsurface drench		480			1,120
Average seedlings per acre				1,173	865	620	640	2,336

[a] All plots 1 sq. rod in size. Numbers in parenthesis are original plot numbers at Swauk Creek.
[b] Chemical applied during field season of 1932

TABLE NO. 19

SEEDLING OCCURRENCE FOLLOWING CHEMICAL, HAND AND BULLDOZING METHODS OF ERADICATION ON COEUR D'ALENE AND ST. JOE NATIONAL FORESTS

Drainage	No. Sq. Rod Plots	Area Status	R. petiolare 1937	1936	1935	R. lacustre 1937	1936	1935	R. inerme 1937	1936	1935	Total Seedlings
[illegible] Cr.	2	Eradicated 1936	[illegible]			1			45	2	1	[illegible]
[illegible] Cr.	2	" 1936	[illegible]	[illegible]	[illegible]	4	2					[illegible]
[illegible] Cr.	2	Bulldozed 1936				[illegible]	[illegible]	1	8			242
[illegible] Dog Cr.	2	" 1936				[illegible]	[illegible]		12	4		[illegible]
[illegible] Cr.	2	" [illegible]				[illegible]	76	3	[illegible]	9	1	112
[illegible] Cr.	2	" [illegible]				[illegible]	[illegible]			3	[illegible]	[illegible]
[illegible] Cr.	2	" [illegible]				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]

[illegible]

[illegible]

During the field season of 1937 the growth and regeneration [illegible] stream type areas of the Inland Empire were studied on an extensive [illegible] utilizing the plots and previously recorded data from the regeneration [illegible] conducted by E. L. Joy from 1929 to 1934. These plots were relocated [illegible] and checked in 1937. In general, the same type of data was taken as had [illegible] previously recorded. These data, however, were compiled and analyzed [illegible] different angle and for this reason all previous field records as well [illegible] taken in 1937 were utilized. Description of the plots, their location [illegible] of taking field data and previous discussions on this general subject [illegible] in the 1934 annual report, pages 254-260, inclusive.

An annual inspection of the plots in the 14 drainages [illegible] from 1929 to 1934, inclusive. This study was dropped at the close of [illegible] season because of the shortage of funds. No data are available for [illegible] and 1936.

[illegible]

[illegible] chemical sprays. [illegible] layer.

In the eradication of a stream type area, the first [illegible] down the original ribes concentration. The result of this [illegible] disturbance will be the greatest stimulation of seedling regeneration. [illegible] [illegible]

Extensive germination of stored ribes seed in stream type [illegible] after a major disturbance of the area. Regeneration from stored [illegible] continue until the supply of viable seed is exhausted. The introduction [illegible] seed into the area must, of course, be prevented. The peak of seedling [illegible] tion comes one year after the initial eradication followed by [illegible] each succeeding year thereafter. The mortality of seedlings is high [illegible]

[illegible] and winter following [illegible]. A few seedlings [illegible] appear in stream type each year because of the [illegible] erosion. It is evident from the data [illegible] are also followed by new seedlings although [illegible]. Seedlings of R. *petiolare* were most numerous followed by those [illegible] and R. *inerme*. The majority of the R. *petiolare* seedlings [illegible] second eradication by the chemical sprays. They may be killed [illegible] ment or indirectly from spray received when application is being made [illegible] bushes or resprouts.

Ribes live stem from seedlings, which is quite insignificant [illegible] year after initial work, increases steadily each year thereafter until [illegible] working. The established seedlings which are missed, and the additional [illegible] seedlings which are bound to appear after each disturbance account for [illegible] in live stem after the second and third workings. The small size of [illegible] largest of these seedlings and the fact that they are screened by other [illegible] makes their eradication a difficult problem.

To indicate the average reduction that is attained by each [illegible] cation, the data have been compiled to show the average amount of [illegible] acre before and after each working and the percent of live stem [illegible] case. This information is presented in Table No. 23. Very little [illegible] amount of live stem present was recorded from the check made immediately [illegible] the initial eradication and the check one year later. The checks [illegible] after the second and third eradications showed a decided decrease [illegible] of live stem removed, largely because of the earlier removal of [illegible] the larger size classes.

The distribution of ribes bushes within each milacre by [illegible] class is presented in Table No. 24. Before the first eradication [illegible] 80 percent of all ribes bushes had live stem in excess of 10 feet. [illegible] second and third eradications the ratio of large to small bushes had [illegible] that more than 80 percent of the remaining bushes had less than 10 feet of [illegible] stem per bush. The necessity of dealing with small bushes during [illegible] third workings accounts for the apparent ineffective reduction of [illegible] subsequent to the initial work. Since ribes bushes with 10 feet [illegible] less are very often screened by other brush and herbaceous growth [illegible] type, many of these bushes will be missed by the eradicators. [illegible] apparent that after the removal of the larger bushes, the further [illegible] the remaining live stem becomes more difficult.

After each ribes eradication the missed bushes make new [illegible] crowns that were left in the ground send up new stems and seedlings [illegible] from the seed stored in the duff and humus layers. These types of [illegible] account for the annual increment of ribes live stem. The average [illegible] ment by species, and for all species combined, has been computed [illegible] to five year period from the yearly growth of ribes remaining and [illegible] in 13 drainages. Treatment of the data in this fashion provides [illegible]

as a basis for estimating average annual increment [illegible] case was there any known disturbance of the areas [illegible] results of this study are as follows.

R. *inerme*	68.9 percent increment per acre
R. *petiolare* . .	50.7 percent increment per acre
R. *lacustre* . . .	40.1 percent increment per acre
All Species . . .	50.8 percent increment per acre

There were two cases for which a decrease in ribes live [illegible] recorded in the years 1931 and 1932. No explanation can be given [illegible] apparent anomalies. For statistical treatment the data from these [illegible] regarded as normal and are averaged with the 35 instances of increase. Reference should be made to Table No. 4, page 257 of the 1934 annual [illegible] to observe the variation in minimum and maximum live stem increment [illegible] by forest units. Approximate increment on the per acre basis for all [illegible] the 13 drainages is 50 percent annual live stem. It was found that [illegible] varied considerably by drainages and by species present within each [illegible] It should be kept definitely in mind that an average increment figure [illegible] applicable only over a large number of drainages.

Progress of eradication work is best measured in terms of [illegible] bearing area from which ribes bushes have been eliminated. Throughout [illegible] study field data have been recorded on the basis of milacres. Table [illegible] has been prepared to show the number of milacres originally bearing [illegible] species, and the elimination of these units of area from the [illegible] picture as ribes bushes were removed by the various workings. [illegible] available show that the highest percentage of milacres from which [illegible] been eliminated has been realized for R. *petiolare* with [illegible] R. *lacustre* and R. *inerme* in the order named. For all species [illegible] that after the first eradication 53.1 percent of the original [illegible] was ribes free as the result of eradication, after the second working [illegible] percent, and after the third 92.3 percent. These areas will [illegible] so long as no additional disturbance causes seed to germinate or [illegible] seed is carried in from some outside source. [illegible] exist on these areas for the seed to [illegible] The environmental factors that tend to [illegible] competition are also operative in stream type. [illegible] closing in to produce unfavorable site [illegible] seedling survival. This cover also decreases the [illegible] natural disturbances by stream erosion.

The exact time to undertake the second [illegible] in stream type has not been determined. [illegible] will depend to a large extent on the proximity of [illegible] causing if present, as well as the period at which ribes [illegible] and the number of ribes remaining or developing after each working. [illegible] sufficient data have not been obtained to determine the age at which [illegible] ribes commence fruiting.

SUMMARY

1. The 2[illegible] plots originally established on [illegible] and Clearwater Timber Protective Association lands are now [illegible] instead of the 1[illegible] plots which were formerly reported on [illegible] report.

2. The check made in these 14 drainages showed that 2[illegible] percent [illegible] total area was ribes bearing prior to the initial eradication [illegible] the first eradication, 4.3 percent after the second and [illegible] third.

3. The initial eradication reduced an average of 36 264 feet of [illegible] stem per acre to 957 feet as shown by the check made immediately after [illegible] cation. This is a 97.4 percent reduction. The check made one year [illegible] a reduction from the original 36 264 feet of ribes live stem per acre [illegible] which is a 96.8 percent breakdown. This is a live stem increase over [illegible] shown by the check made immediately after eradication. Data showed [illegible] root crown resprouting and layering were responsible for this live stem [illegible]

4. The first eradication reduced the number of milacres [illegible] 2,291 to 530. On the basis of milacres on which ribes [illegible] a 76.9 percent reduction. The check made one year later showed [illegible] milacres originally bearing ribes had been reduced to 1,076 or a [illegible] reduction of 53.1. This is an increase over the number of milacres [illegible] as shown by the check immediately after eradication due to [illegible] from broken crowns and layering.

5. The second working reduced 1 5[illegible] feet of ribes live [illegible] 414 feet per acre, or a 73.3 percent reduction.

6. The second eradication reduced the 1,076 milacres [illegible] bearing after the first working to 330 milacres. [illegible] of the original ribes bearing area can now be classed as ribes [illegible] further disturbance results in ribes regeneration from seed.

7. The third working reduced [illegible] feet of ribes live stem [illegible] feet per acre, or a 49.6 percent reduction.

8. The third eradication reduced the [illegible] ribes bearing after the second working to [illegible] of the original ribes bearing area [illegible] as ribes free.

9. In terms of percentage [illegible] ribes [illegible] the use of [illegible] [illegible] R. lacustre [illegible] R. petiolare [illegible]

10. Better than [illegible] before the initial eradication [illegible] prior to the second and third working [illegible]

[illegible]

11. [illegible] seedlings [illegible] appear after the [illegible] eradication work. R. petiolare, R. lacustre and R. inerme [illegible] produce decreasing numbers of seedlings.

12. The largest numbers of seedlings appear on the stream type [illegible] first and second years after the initial ribes eradication.

13. The mortality rate of seedlings is highest during the [illegible] following germination. At the time of the second and third eradications R. petiolare seedlings are reduced in greatest numbers because of the [illegible] indirect application of chemical sprays.

14. Once the peak of seedling regeneration has been passed, [illegible] seedlings can be expected to develop after the disturbance caused [illegible] succeeding working and from natural disturbances such as stream erosion. [illegible] can be expected to continue until all viable stored seed is exhausted [illegible] there is no chance of new seed being introduced from outside sources [illegible] fruiting of ribes on the eradicated areas.

15. The proper interval between the first and second, second [illegible] and succeeding workings of an area will depend to a large extent [illegible] of the rust [illegible] damaging effects if present and the period [illegible] seed production begins. The numbers of original bushes still [illegible] areas will of course [illegible] just how [illegible] may [illegible] performing additional eradication work.

[illegible]

[illegible]

POTLATCH UNIT

Status of Area	Feet of Ribes Live Stem Per Acre: E. Fk. of Potlatch Creek	Mallory Creek	Deep Creek	Johnson Creek	Cameron Creek	[illegible]
Imm.* before 1st erad.	120,737	61,301	13,531	34,426	[illegible]	[illegible]
Imm.* after 1st erad.	338	506	233	1,654	2,120	[illegible]
1 yr. after 1st erad.	534	713	323	1,847	2,948	[illegible]
2 yrs. after 1st erad.	519	1,067	(a)265			
3 yrs. after 1st erad.	627	790	457			
4 yrs. after 1st erad.	987	1,288	(a)282			
5 yrs. after 1st erad.			447			
1 yr. after 2nd erad.	383	566	159	809	537	[illegible]
2 yrs. after 2nd erad.				1,414	680	[illegible]
4 yrs. after 2nd erad.						
1 yr. after 3rd erad.				540	391	[illegible]
2 yrs. after 3rd erad.					419	
3 yrs. after 3rd erad.	293	111		741		
4 yrs. after 3rd erad.						[illegible]

CLEARWATER UNIT

Status of Area	Feet of Ribes Live Stem Per Acre: Deer Creek	N. Fk. of S. Fk. of Reed's Creek	S. Fk. of Reed's Creek	N. Fk. of Reed's Creek	Alder Creek	[illegible]	[illegible]
Imm.* before 1st erad.	32,317	52,527	37,471	27,127	11,639	[illegible]	
Imm.* after 1st erad.	105	150	203		657	[illegible]	
1 yr. after 1st erad.	379	791	290	841	1,307	[illegible]	
2 yrs. after 1st erad.	(b)194	1,217	813	1,380	1,763	[illegible]	
1 yr. after 2nd erad.	81	30	109	(c) 245	(c)[illegible]		
2 yrs. after 2nd erad.	247	207	358	(c)1,680			
3 yrs. after 2nd erad.	449	391					
Imm.* after 3rd erad.							
1 yr. after 3rd erad.			206	418	[illegible]		
2 yrs. after 3rd erad.					283	[illegible]	
4 yrs. after 3rd erad.							
5 yrs. after 3rd erad.	381	[illegible]	208	[illegible]	[illegible]		

* Immediately
(a) Reduction caused by grazing and logging.
(b) Reduction caused by logging railroad construction
(c) Partial third eradication before the plots were checked

TABLE NO. 21

RIBES LIVE STEM PER ACRE BY SPECIES BEFORE AND AFTER EACH ERADICATION

POTLATCH UNIT

[illegible]	No. of Drainages Checked	Total Acres Checked	Percent and Average Feet of Ribes Live Stem Per Acre						
			R. petiolare		R. lacustre		R. inerme		
			F.L.S	Per Cent	F.L.S.	Per Cent	F.L.S.	Per Cent	F.L.S. All Species
Imm.* before 1st erad.	7	3,794	26,924	71.5	9,500	25.3	1,184	3.2	[illegible]
Imm.* after 1st erad.	6	2,908	1,029	75.6	193	14.2	138	10.2	1,360
1 yr. after 1st erad.	7	3,794	1,216	64.9	336	17.9	322	17.2	1,874
Imm.* before 2nd erad.	6	2,908	1,382	69.4	259	13.1	348	18.0	[illegible]
1 yr. after 2nd erad.	6	2,908	178	36.0	104	22.1	[illegible]	42.9	[illegible]
Imm.* before 3rd erad.	3	1,722	231	26.3	101	11.5	546	62.2	[illegible]
1 yr. after 3rd erad.	3	1,728	49	11.6	38	9.1	334	[illegible]	[illegible]

CLEARWATER UNIT

[illegible]	No. of Drainages Checked	Total Acres Checked	R. petiolare F.L.S	Per Cent	R. lacustre F.L.S.	Per Cent	R. inerme F.L.S.	Per Cent	F.L.S. All Species
Imm.* before 1st erad.	[illegible]	[illegible]	22,931	89.2	1,910	7.5	[illegible]	[illegible]	[illegible]
Imm.* after 1st erad.	6	[illegible]	162	46.2	159	45.3	30	8.5	[illegible]
1 yr. after 1st erad.	[illegible]	[illegible]	334	50.0	225	33.7	[illegible]	[illegible]	668
Imm.* before 2nd erad.	[illegible]	4,370	511	55.7	306	33.3	[illegible]	[illegible]	[illegible]
1 yr. after 2nd erad.	6	4,370	169	63.8	60	22.6	[illegible]	13.6	[illegible]
Imm.* before 3rd erad.	[illegible]	[illegible]	370	60.3	[illegible]	22.9	[illegible]	[illegible]	[illegible]
1 yr. after 3rd erad.	[illegible]	[illegible]	157	46.9	110	32.8	[illegible]	[illegible]	[illegible]

BOTH UNITS

[illegible]	No. of Drainages Checked	Total Acres Checked	R. petiolare F.L.S	Per Cent	R. lacustre F.L.S.	Per Cent	R. inerme F.L.S.	Per Cent	F.L.S. All Species
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	6,116	[illegible]	69.2	175	21.0	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	60.5	375	23.6	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	859	63.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	48.3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	31.7	[illegible]	[illegible]	[illegible]

[illegible]

TABLE NO. 22

RIBES SEEDLINGS PER ACRE BY SPECIES BEFORE AND AFTER EACH ERADICATION

POTLATCH UNIT

Status of Area	No. of Drainages Checked	Total Acres Checked	Number, Percent and Feet of Ribes Live Stem Per Acre													
			R. petiolare				R. lacustre				R. inerme				All Species	
			No. Seedlings	Per Cent	F. L. S.	Per Cent	No. Seedlings	Per Cent	F. L. S.	Per Cent	No. Seedlings	Per Cent	F. L. S.	Per Cent	Total Seedlings	Total Live Stem
Imm. *before 1st erad.	[illegible]	2,794														
Imm. *after 1st erad.	6	[illegible]	3	50.0	.6	54.5	1	13.3	.2	18.1	2	36.7	.3	27.4	[illegible]	[illegible]
1 yr. after 1st erad.	[illegible]	[illegible]	331	[illegible]	46.1	71.6	145	21.1	16.8	26.1	11	1.6	1.5	2.3	687	[illegible]
Imm. *before 2nd erad.	6	[illegible]	191	79.3	74.1	86.7	36	14.9	9.5	11.1	14	5.8	1.9	[illegible]	241	[illegible]
1 yr. after 2nd erad.	[illegible]	[illegible]	66	35.3	21.8	64.7	112	59.9	9.2	27.3	9	4.8	[illegible]	8.0	187	[illegible]
Imm. *before 3rd erad.	3	[illegible]	58	72.5	23.8	66.9	6	7.5	3.5	9.8	16	20.0	[illegible]	23.3	80	[illegible]
1 yr. after 3rd erad.	[illegible]	[illegible]	14	[illegible]	8.6	78.9	1	5.8	1.1	[illegible]	2	11.8	[illegible]	11.9	[illegible]	[illegible]

CLEARWATER UNIT

Status of Area	No. of Drainages Checked	Total Acres Checked	R. petiolare No. Seedlings	Per Cent	F. L. S.	Per Cent	R. lacustre No. Seedlings	Per Cent	F. L. S.	Per Cent	R. inerme No. Seedlings	Per Cent	F. L. S.	Per Cent	Total Seedlings	Total Live Stem
[illegible]	[illegible]	[illegible]														
[illegible]	[illegible]	[illegible]	5	71.4	1.2	70.5	2	28.6	.5	29.5					[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	95.9	34.6	96.1	14	4.1	1.4	3.9					[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	81.4	122.9	91.6	84	18.1	[illegible]	8.2	[illegible]	.5	.3	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	14	50.9	7.7	63.6	[illegible]	34.8	4.1	33.9	1	[illegible]	.3	3.5	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	17	[illegible]	10.8	76.6	13	43.3	[illegible]	23.4					[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	60.8	15	[illegible]	[illegible]	39.2					[illegible]	[illegible]

BOTH UNITS

Status of Area	No. of Drainages Checked	Total Acres Checked	R. petiolare No. Seedlings	Per Cent	F. L. S.	Per Cent	R. lacustre No. Seedlings	Per Cent	F. L. S.	Per Cent	R. inerme No. Seedlings	Per Cent	F. L. S.	Per Cent	Total Seedlings	Total Live Stem
[illegible]	[illegible]	[illegible]														
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	24	[illegible]	[illegible]	[illegible]	5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	17.3	[illegible]	9.1	6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	47	[illegible]	[illegible]	29.2	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

TABLE NO. 23

TOTAL RIBES LIVE STEM PER ACRE BEFORE AND AFTER EACH ERADICATION AND PERCENT OF LIVE STEM REMOVED

	Feet of Ribes Live Stem Per Acre							Percent of Live Stem Removed			
	First Eradication			Second Eradication		Third Eradication		First Eradication		Second	Third
[illegible] Unit	Before	Imm.*	After	Before	After	Before	After	Imm.*	After	Eradication	Eradication
Potlatch T.P.A.	45,226	1,419	1,558	2,100	526	901	422	96.9	96.6	75.2	53.6
Clearwater T.P.A.	28,141	538	760	1,185	340	530	285	98.1	97.2	71.3	45.1
Both Units	36,264	957	1,151	1,551	414	681	342	97.4	96.8	73.3	[illegible]

Imm.* Checked immediately after area was eradicated

After Checked one year after area was worked.

[illegible]

DISTRIBUTION OF RIBES BUSHES BY SIZE CLASS [illegible]

POTLATCH UNIT

Status of Area	No. Drain-ages	Total Milacres Bearing Ribes	Percentage of [illegible] Each [illegible] Feet of Live Stem by [illegible] 0-2.5	2.6-5	5.1-10	10.1-[illegible]	[illegible]
Imm.* before 1st erad.	6	1,194	5.6	10.3	12.6	12.1	[illegible]
Imm.* after 1st erad.	6	340	32.6	23.5	20.0	9.2	[illegible]
1 yr. after 1st erad.	6	631	32.4	20.8	19.9	15.5	[illegible]
Imm.* before 2nd erad.	6	636	27.4	22.3	20.3	15.[illegible]	[illegible]
1 yr. after 2nd erad.	6	208	32.7	25.9	26.5	6.[illegible]	[illegible]
Imm.* before 3rd erad.	3	208	31.3	25.0	19.2	12.5	[illegible]
1 yr. after 3rd erad.	3	77	24.7	31.1	18.2	15.6	[illegible]

CLEARWATER UNIT

Status of Area	No. Drain-ages	Total Milacres Bearing Ribes	0-2.5	2.6-5	5.1-10	10.1-[illegible]	[illegible]
Imm.* before 1st erad.	7	1,097	1.4	2.0	6.8	8.8	81.[illegible]
Imm.* after 1st erad.	5	190	36.4	24.7	16.8	10.5	[illegible]
1 yr. after 1st erad.	7	445	46.9	25.5	11.7	10.3	[illegible]
Imm.* before 2nd erad.	6	445	39.3	22.0	17.1	11.[illegible]	[illegible]
1 yr. after 2nd erad.	6	152	41.5	26.3	19.7	7.2	[illegible]
Imm.* before 3rd erad.	4	152	34.8	29.6	22.4	5.3	[illegible]
1 yr. after 3rd erad.	4	100	54.0	25.0	13.0	7.0	[illegible]

BOTH UNITS

Status of Area	No. Drain-ages	Total Milacres Bearing Ribes	0-2.5	2.6-5	5.1-10	10.1-[illegible]	[illegible]
Imm.* before 1st erad.	13	2,291	3.6	6.3	9.8	11.5	[illegible]
Imm.* after 1st erad.	11	530	34.0	23.9	18.9	9.6	[illegible]
1 yr. after 1st erad.	13	1,076	38.4	22.7	16.5	13.[illegible]	[illegible]
Imm.* before 2nd erad.	12	1,081	32.3	22.2	19.0	14.0	[illegible]
1 yr. after 2nd erad.	12	360	35.[illegible]	26.2	23.6	6.[illegible]	[illegible]
Imm.* before 3rd erad.	[illegible]	360	32.8	26.9	20.[illegible]	9.[illegible]	[illegible]
1 yr. after 3rd erad.	[illegible]	177	41.2	27.7	15.3	10.[illegible]	[illegible]

*Immediately implies that the check was made prior to eradication [illegible] varying from one to six weeks

TABLE NO. 25

REDUCTION OF RIBES BEARING AREA RESULTING FROM ERADICATION WORK

Status of Area	No. Milacres Supporting Ribes							
	R. petiolare		R. lacustre		R. inerme		All Species	
	No. Milacres	Percent Reduction	No. Milacres	Percent Reduction	No. Milacres	Percent Reduction	No. Milacres	Percent Reduction
Imm.* before 1st erad.	1,439		579		273		2,291	
1 yr. after 1st erad.	624	56.6	299	49.3	153	43.8	1,076	[illegible]
1 yr. after 2nd erad.	125	91.4	147	74.6	88	67.6	360	[illegible]
1 yr. after 3rd erad.	52	96.4	68	88.2	57	79.3	177	[illegible]

*Immediately

d. FUTURE ECOLOGY WORK IN THE INLAND [illegible]

In the future two types of ecology work should [illegible] Empire. One phase of the work will consist of the analysis of the [illegible] check, regular check, post check and eradication records for [illegible] following the ecological case history by types in the control areas. [illegible] records should be compiled so as to allow evaluation of the signi[illegible] ribes population in terms of the data obtained from the studies on effe[illegible]ness of control. Ribes data should therefore be segregated to show [illegible] the numbers of ribes and growth for missed veteran bushes, broken [illegible] seedlings. This work is extensive in nature and can be best accomp[illegible] through cooperation between the methods, checking and eradication [illegible]

The second phase of the ecology work will consist of the [illegible] of such special plots as seem to be necessary for the interpretation [illegible]tensive data. These plots will furnish data on questions which have not [illegible] thoroughly or satisfactorily answered by previous work. The following [illegible] especially important:

1. Establishment of ribes regeneration plots in forest areas underg[illegible] different types of management. This work can be most effectively done [illegible] cooperation with the Forest Service.

2. A study to determine the effects of plant competition upon [illegible] longevity and period of seed production in developing stands. Seedling [illegible]tion and percentage survival after disturbances will also be studied [illegible] the eradication types.

3. To determine how long an area can be left after receiving a [illegible] turbance such as logging or fire before the growth of vegetation, other [illegible] ribes, seriously affects their detection by eradicators and impedes [illegible] the crews.

4. Determination of the age at which stream type ribes produce [illegible] observations to be made for newly established seedlings and for [illegible] bush from a veteran crown.

5. Continuation of the growth and regeneration plot studies [illegible] stream type.

6. Continuation of seedling occurrence and survival [illegible] areas worked by hand, by chemical and by bulldozing methods [illegible]

7. Establishment of seedling occurrence plots [illegible] determination of the age at which seeding commences from new growth of [illegible] crowns

8. Underground storage of a supply of seed from each [illegible] the Inland Empire for the purpose of making direct tests on the [illegible] such seed can remain viable.

PHOTOGRAPHIC AND EDUCATIONAL WORK, 1937

By
R. L. MacLeod
Associate Pathologist

Photographic and educational work was continued in 1937 [illegible] basis as in previous years. H. Miller Cowling, assisted by two temporary [illegible] continued in charge of the photographic work and the writer was responsible [illegible] the educational work. The two phases of work are considered separately [illegible] report.

A. Photographic Section.

The purpose of the photographic section is to maintain a [illegible] record of all phases of investigative and control work, to provide the [illegible] visory field personnel with photographs and maps which will facilitate [illegible] work, to provide an effective means of enlarging or reducing maps and [illegible] the size suitable for reports or for field use and to provide the educational section with illustrative material.

During 1937 all types of work outlined here were continued. [illegible] leader made field trips to several operations in both the Sugar Pine and [illegible] western regions in order to keep the files up to date with illustrations [illegible] types of control and investigative work. Enlargements were made [illegible] of base maps of various operations. These maps are necessary in the [illegible] the proper recording of data and for the efficient consummation of control [illegible] In the office, reproductions were made of charts, graphs and maps for [illegible] and other special reports.

An important phase of photographic work is the use of the Multilith [illegible] machine. This has proved to be extremely valuable in reproducing large [illegible] of temporary forms and cards. Large numbers of forms are used each year. [illegible] forms are changed according to developments in the work, sometimes [illegible] occasionally during the year. It is extremely valuable to have a machine [illegible] can turn out forms and cards without causing any delay in the work.

The amount of photographic and Multilith work produced during [illegible] shown in Table No. 1.

TABLE NO. [illegible]

PHOTOGRAPHIC AND MULTILITH WORK

PHOTOGRAPHIC

Item	Sugar Pine Region	Northwestern Region	[illegible]
Lantern slides	[illegible]	237	
Films developed - Film packs		3	
- Field films	226	146	
Copies - 5x7	1	40	
8x10	12	485	[illegible]
Printing - 4x5 or smaller		154	
5x7	4 331	2,768	[illegible]
8x10		2,214	[illegible]
9x11	692	5 480	[illegible]
Enlarging- 11x14 or smaller	2	36	
16x20	325	253	[illegible]
20x30	6	[illegible]2	
30x40	12	454	
40x60		10	

MULTILITH

Item	North-western Region	Sugar Pine Region	Other	[illegible]
Copies	61	64	[illegible]	
Plates made	62	64	[illegible]	
Cards printed	49 [illegible]	10 500	10 [illegible]	
Printed reverse side	30 000	[illegible],000	10 [illegible]	[illegible]
Total prints made (Cards)	[illegible]9 200	17 500	20 [illegible]	
Paper printed	[illegible]49 000	13 100	20 [illegible]	
Printed reverse side	43 [illegible]	1 100	[illegible]	
Total prints made (Paper)	192 [illegible]	14 200	24 [illegible]	[illegible]
Tot. piece prints run for current year				[illegible]

[illegible]

The function of educational work is to acquaint the [illegible] personnel, timber owners or administrators and the general public [illegible] rust control problem. During 1937, the following work was carried on [illegible]

1. Bulletins and Specimens

Each year a supply of specimen material showing various [illegible] rust is gathered for distribution. During 1937 about three dozen [illegible] of aecial specimens and of pycnial or discoloration specimens were collected [illegible] the project leader. Several thousand leaves showing uredial and telial [illegible] were collected for mounting.

No additional bulletins were written this year, but the Question [illegible] Answer bulletin was brought up to date. The distribution of bulletins [illegible] specimens is shown in Table No. 2.

TABLE NO. 2

EDUCATIONAL MATERIAL SUPPLIED IN 1937

Agency	Bulletins					Specimens		
	B.R.C	Q & A	No 23	Pack	Misc.	Discoloration and Pycnia	Aecia	[illegible]
Public	16	21	53	4	[illegible]	1	[illegible]	
Schools and Colleges	56	81	106	3	9	[illegible]	[illegible]	[illegible]
CCC Camps and U.S.F.S.	168	112	126	12	[illegible]	[illegible]	[illegible]	[illegible]
Sugar Pine region				50		[illegible]	[illegible]	[illegible]
ERC Camps	300	925	925	50				
County Fairs	2,000	4,000	4,000	200				
Total	2,540	5,145	5,210	319	[illegible]	[illegible]	[illegible]	[illegible]

Bulletins

B.R.C. - Blister Rust Control in the Inland Empire.
Q & A - Questions and Answers Concerning White Pine Blister Rust
No. 23 - Miscellaneous Publication No. [illegible]
Pack - White Pine Blister Rust - [illegible]
[illegible]
Miscellaneous - Blister Rust - A Comparison of European with North American Conditions.
Some Characteristics of Conifers in the Inland Empire
The Chemical Eradication of Ribes
Sugar Pine
Western White Pine

2. Lectures.

Illustrated lectures concerning [illegible] were given by the project leader to the Lions Club at Spokane, Washington, [illegible]; to the Associated Foresters of the University of Idaho at Moscow, Idaho in [illegible]; to the Hoo Hoo Club, an organization of lumbermen at Spokane, Washington [illegible]; and to the Dominion Club, an organization of [illegible] Spokane, Washington in November.

These talks illustrated with lantern slides, were effective in [illegible] the reasons and necessity for controlling the rust in the [illegible].

3. Fairs.

A blister rust exhibit was shown in the Sportsman's [illegible] Spokane, Washington in May. The [illegible] of a portable [illegible] booth. A large dead tree which had been killed by [illegible] the booth. This and the [illegible] showing all phases of the disease and control work [illegible] the booth. Inside the portable [illegible] disease, pictures of control work, and [illegible] member of the blister rust personnel was on hand [illegible] and distribute bulletins. It was estimated that [illegible] people who attended the fair visited the blister rust exhibit.

With the exception that the dead [illegible] type of exhibit was placed in county fairs at [illegible] and [illegible].

4. General Publicity.

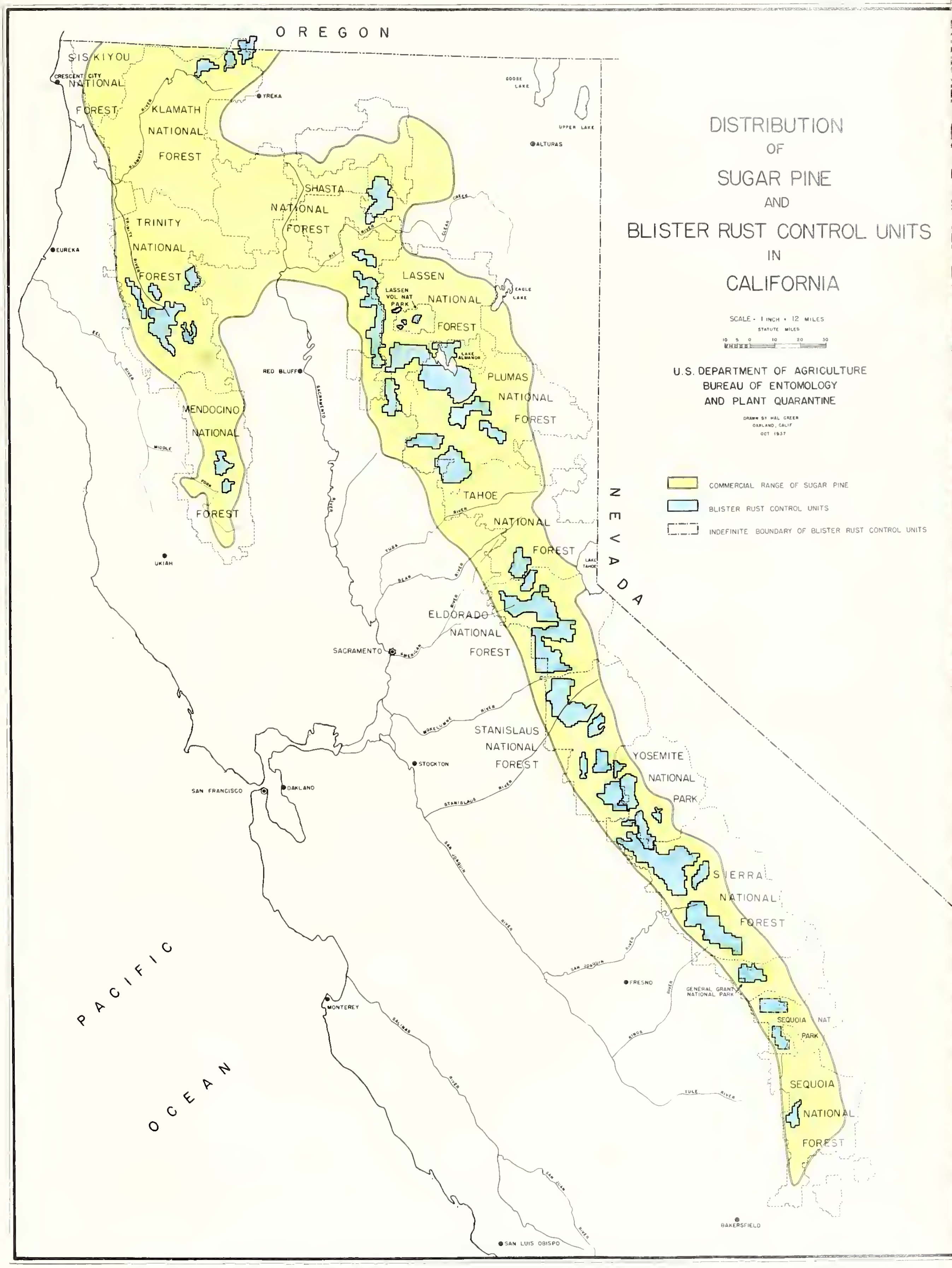
During the year numerous newspaper articles [illegible] papers throughout the region. These articles [illegible] home to the general public the importance of [illegible] conserving it for the future. [illegible] until the damage from blister rust is [illegible] control work. Making the timber owners and public [illegible] necessary in order to conserve a great national [illegible] requires an effective and well rounded plan of educational work.

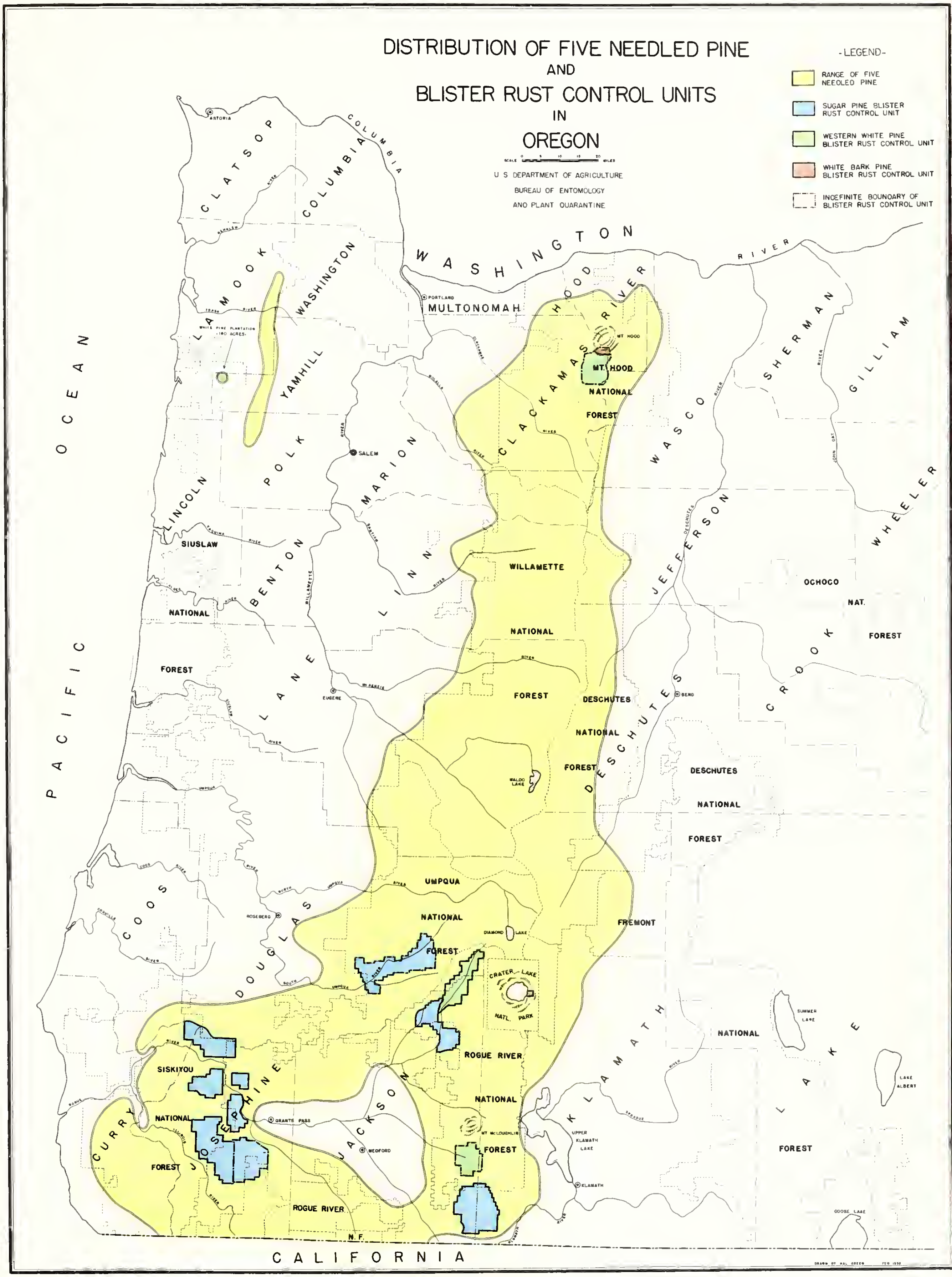
REPORT OF BLISTER RUST CONTROL ACTIVITIES

in the

SUGAR PINE REGION FOR THE CALENDAR YEAR 1937

Division of Plant Disease Control
Bureau of Entomology and Plant Quarantine
United States Department of Agriculture
610 Syndicate Bldg.,
Oakland, Calif.


DISTRIBUTION
OF
SUGAR PINE
AND
BLISTER RUST CONTROL UNITS
IN
CALIFORNIA
SCALE - 1 INCH = 12 MILES
STATUTE MILES
10 5 0 10 20 30
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY
AND PLANT QUARANTINE
DRAWN BY HAL GREER
OAKLAND, CALIF
OCT 1937
COMMERCIAL RANGE OF SUGAR PINE
BLISTER RUST CONTROL UNITS
INDEFINITE BOUNDARY OF BLISTER RUST CONTROL UNITS
OREGON
NEVADA
PACIFIC
OCEAN
SISKIYOU NATIONAL FOREST
KLAMATH NATIONAL FOREST
TRINITY NATIONAL FOREST
SHASTA NATIONAL FOREST
LASSEN NATIONAL FOREST
LASSEN VOL NAT PARK
PLUMAS NATIONAL FOREST
MENDOCINO NATIONAL FOREST
TAHOE NATIONAL FOREST
ELDORADO NATIONAL FOREST
STANISLAUS NATIONAL FOREST
YOSEMITE NATIONAL PARK
SIERRA NATIONAL FOREST
GENERAL GRANT NATIONAL PARK
SEQUOIA NAT PARK
SEQUOIA NATIONAL FOREST
CRESCENT CITY
TREKA
GOOSE LAKE
UPPER LAKE
ALTURAS
EUREKA
EAGLE LAKE
LAKE ALMANOR
RED BLUFF
UKIAH
LAKE TAHOE
SACRAMENTO
STOCKTON
SAN FRANCISCO
OAKLAND
FRESNO
MONTEREY
BAKERSFIELD
SAN LUIS OBISPO
KLAMATH RIVER
TRINITY RIVER
PIT RIVER
EEL RIVER
MIDDLE FORK
SACRAMENTO RIVER
FEATHER RIVER
YUBA RIVER
BEAR RIVER
AMERICAN RIVER
MOKELUMNE RIVER
STANISLAUS RIVER
SAN JOAQUIN RIVER
KINGS RIVER
TULE RIVER
SALINAS RIVER



DISTRIBUTION OF FIVE NEEDLED PINE
AND
BLISTER RUST CONTROL UNITS
IN
OREGON
U S DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY
AND PLANT QUARANTINE
-LEGEND-
RANGE OF FIVE NEEDLED PINE
SUGAR PINE BLISTER RUST CONTROL UNIT
WESTERN WHITE PINE BLISTER RUST CONTROL UNIT
WHITE BARK PINE BLISTER RUST CONTROL UNIT
INDEFINITE BOUNDARY OF BLISTER RUST CONTROL UNIT
WASHINGTON
CALIFORNIA
PACIFIC OCEAN
CLATSOP
COLUMBIA
TILLAMOOK
WASHINGTON
MULTONOMAH
HOOD RIVER
SHERMAN
GILLIAM
WASCO
YAMHILL
POLK
MARION
CLACKAMAS
LINCOLN
BENTON
LINN
JEFFERSON
WHEELER
CROOK
LANE
DESCHUTES
DOUGLAS
COOS
CURRY
JOSEPHINE
JACKSON
KLAMATH
LAKE
MT. HOOD NATIONAL FOREST
SIUSLAW NATIONAL FOREST
WILLAMETTE NATIONAL FOREST
OCHOCO NAT. FOREST
DESCHUTES NATIONAL FOREST
UMPQUA NATIONAL FOREST
FREMONT NATIONAL FOREST
ROGUE RIVER NATIONAL FOREST
SISKIYOU NATIONAL FOREST
ROGUE RIVER N.F.
CRATER LAKE NATL. PARK
ASTORIA
PORTLAND
SALEM
EUGENE
BEND
ROSEBURG
GRANTS PASS
MEDFORD
KLAMATH
WHITE PINE PLANTATION 180 ACRES
MT HOOD
WALDO LAKE
DIAMOND LAKE
MT McLOUGHLIN
UPPER KLAMATH LAKE
SUMMER LAKE
LAKE ALBERT
GOOSE LAKE
COLUMBIA RIVER

CONTENTS

W-1961 - TYPICAL FORM OF THE CROWN OF A MATURE SUGAR PINE.
NOTE CONES HANGING FROM TIPS OF BRANCHES.

W-1912 - A MAMMOTH SUGAR PINE NEAR PROSPECT, OREGON.
DIAMETER 8 FEET, 7 INCHES, HEIGHT 225 FEET, AGE 500 YEARS, BOARD FEET 29,350.

REPORT OF BLISTER RUST CONTROL ACTIVITIES IN THE SUGAR PINE REGION, CALENDAR YEAR 1937.

PART I - GENERAL

By

Warren V. Benedict, Senior Forester

INTRODUCTION

White pine blister rust was first discovered in the sugar pine types of the Sugar Pine Region in 1936. Infections on both sugar pines and Ribes were located in southwestern Oregon and in northwestern California, the southernmost infections being a few miles south of the Oregon-California boundary.

Of particular significance during 1937 was the wide spread of the rust throughout the sugar pine type of southern Oregon and its southward advance deep into California. Infections were found on the Ribes host on the Trinity and Lassen National Forests at points approximately 125 miles south of the state line. Infections on Ribes were general over much of southern Oregon and the Klamath National Forest in California. Scattered infections were also located on the Shasta National Forest. The region in California in which infections have been located to date includes four national forests encompassing the five counties of Del Norte, Siskiyou, Shasta, Trinity, and Tehama. The maps appearing in Part V show the locations of discoveries of rust made during the last two years in southern Oregon and northern California. The wide spread during 1937 has brought the rust from the fringes to well within the commercial sugar pine belt, and has focused the attention of persons interested in sugar pine on the need for expediting control work.

ORGANIZATION AND ADMINISTRATION

Blister rust control work in the Sugar Pine Region, comprising the states of California and Oregon, was conducted as a cooperative undertaking in accordance with agreements between the Bureau of Entomology and Plant Quarantine and each of the cooperating states and between the Bureau and the Forest Service.

In California the state agencies cooperating with the Bureau are:

1. The California State Department of Agriculture.
2. The Division of Forestry of the California State Department of Natural Resources.
3. The College of Agriculture, University of California.
4. The Department of Botany, University of California.
5. The Botanical Garden, University of California.

In Oregon the state agencies cooperating with the Bureau are:

1. The Bureau of Plant Industry of the Oregon State Department of Agriculture.
2. The Oregon State Board of Forestry.

Copies of the 1937 renewals of the memoranda of agreement for the states of California and Oregon, originally executed in 1936, appear at the end of Part I.

Since Federal funds for the control of white pine blister rust are allotted both to the Bureau of Entomology and Plant Quarantine and to the Forest Service, a formal cooperative agreement was approved by the two bureaus in 1937 outlining general policies to be followed in conducting control operations. As outlined in this agreement the administrative responsibility for control work is divided between the two agencies on the basis of land ownership, the Bureau maintaining the responsibility for work on lands in state and private ownership and the Forest Service for work on lands under national forest stewardship. The Bureau possesses the added responsibility for general technical supervision and coordination of all control operations irrespective of land ownership.

Control work in California during 1937, effective July 1, was jointly administered by this office and Region 5 of the Forest Service in accordance with the general principles set forth in the inter-bureau agreement, but modified to meet the land ownership situation existing in the sugar pine belt. In keeping with the cooperative agreement the following plan was adopted:

1. The camp area was chosen as the unit for dividing control work between agencies, that is, camp units in predominantly national forest ownership were assigned to the Forest Service and those predominantly in state or private ownership to the Bureau. This procedure represented a flexible and equitable arrangement inasmuch as it permitted each agency to operate on a national forest to the extent that the lands for which it is responsible are present.

2. On each of the four national forests where blister rust operations are under way, namely, Plumas, Eldorado, Stanislaus, and Sierra, the Bureau provided a technical or operation supervisor and a checking supervisor to meet its responsibility for technical direction of the work, and the Forest Service provided a blister rust control officer on each forest to administer the work of Forest Service camps. The Forest Service blister rust officers were obtained by transfer from the Bureau on July 1.

3. In addition to paying the salaries of its four administrative officers, the Forest Service reimbursed the Bureau for supervision of checking done on national forest lands, by a transfer of sufficient funds to cover the salaries and expenses of two of the Bureau's checking supervisors.

A copy of the cooperative agreement as modified to meet conditions in California appears at the end of Part I.

During 1937 control work in Oregon, which is in Forest Service Region 6, was all handled by the Bureau since Region 6 received no allocation of funds for blister rust control work.

Land ownership in the control units of California and Oregon is roughly fifty per cent national forest so that the division of work between the two agencies will be approximately equal.

In operating under the cooperative agreement of 1937, there was naturally a close relationship prevailing between the two agencies. The result was that to all practical purposes the job was handled as one general program, although financially each agency maintained a distinctly separate accounting of its funds and the work done from its camps.

The regular full time appointed personnel of the Sugar Pine Region employed during 1937 are:

General Supervision

Warren V. Benedict, Senior Forester.....Regional Leader, in charge.
Thomas H. Harris, Associate Forester....Assistant Regional Leader, in charge of checking.

Operation Supervisors

Frank A. Patty, Associate Pathologist (Sierra)
Roy Blomstrom, Associate Forester (Stanislaus)
Douglas R. Miller, Associate Forester (Eldorado)
Benton Howard, Associate Forester (Plumas)
Conrad P. Wessela, Associate Forester (Oregon operation)

Assistant Operation Supervisors

Eugene H. Kincaid, Agent (Eldorado)
Robert Sovulewski, Agent (Oregon operation)

Checking Supervisors

John N. Mitchell, Assistant Forester (Sierra)
Carl W. Fowler, Assistant Forester (Stanislaus)
John C. Crowell, Agent (Eldorado)
S. Daryl Adams, Agent (Plumas)
Lyle N. Anderson, Agent (Oregon operation)

Developmental Work in Control Methods

Clarence R. Quick, Assistant Pathologist, and Lawrence P. Winslow, Agent. These men, although under the jurisdiction of H. R. Offord, Pathologist, in charge of the Berkeley office, are included here since they are assigned to the Sugar Pine Region.

Office Administration, Oakland Regional Office

Ralph H. Simons, Jr. Administrative Assistant.. Assisted by - Orvis R. Decious, Senior Clerk (Bookkeeping), Ethelyn Seeman, Clerk (preparation of pay rolls), Rose E. Yaras, Clerk-Stenographer (secretarial, personnel, and in charge of stenographic force), and Frances H. Greenfield, Assistant Clerk-Stenographer (secretarial, in charge of files, auditing and preparation of expense accounts and leave records).	In charge of Business Administration, Fiscal and Clerical.

In accordance with the terms of the cooperative agreement between this office and Region 5 of the Forest Service governing blister rust operations in California, the following persons were transferred from this office to the Forest Service on July 1:

Robert M. Riley, Assistant Forester (Resigned October 8, 1937)
Arthur London, Assistant Pathologist
Ralph A. James, Assistant Forester

For the period July 1 to December 31, 1937 the Forest Service reimbursed this office for the salaries and expenses of Eugene H. Kincaid, Agent (assistant operation supervisor on the Eldorado operation), John N. Mitchell, Assistant Forester, and S. Daryl Adams, Agent, checking supervisors on the Sierra and Plumas operations, respectively.

The following personnel resigned from this office during 1937:

Glenn S. Groom, Senior Clerk, Dr. Carl C. Epling, and Professor A. O. Garrett, Collaborators.

George A. Root, Associate Pathologist (State Leader), transferred to the Division of Domestic Plant Quarantine August 1, 1937.

Special Summaries of Blister Rust Accomplishments

The special summaries of blister rust activities inaugurated in 1936 in accordance with the outline prepared by the Division Office of Plant Disease Control, and appearing for the first time in the 1936 annual report, have been revised to incorporate accomplishments during 1937. These summaries, appearing at the end of Part I of this report are as follows:

Table No. 1 - Summary of all Ribes eradication during 1937 by number of working.

Table No. 1A - Summary of all Ribes eradication, by number of working (1923-1937 inclusive).

Table No. 2 - Summary of Ribes eradication during 1937 by programs.

Table No. 2A - Summary of all Ribes eradication by programs (1923-1937 inclusive).

Financial

As in 1935 and 1936, the 1937 season was characterized by the use of funds from the Emergency Relief Appropriation Act. Except for part of the scouting project and the salaries of some of the regular personnel and miscellaneous office expenditures, all field activities were financed from emergency allotments. In Table No. 7 is shown by appropriations and by projects a classification of expenditures of funds allotted to the Sugar Pine Region for the calendar year 1937. Table No. 8 shows similar information with respect to expenditures for blister rust work in California by Region 5 of the Forest Service. No expenditures were made in 1937 in Oregon by Region 6 of the Forest Service.

In addition to control work done under the above allotments, the National Park Service did some Ribes eradication work with Civilian Conservation Corps enrollees at Crater Lake National Park in Oregon and Forest Service Region 5 assigned two CCC camps to blister rust control in California. No complete record of expenditures for work done by the CCC is available, although a record of accomplishments appears under the specific project to which it applies, elsewhere in this report.

The regulations governing the expenditure of emergency funds required that at least 95 per cent of all persons employed be paid security wages and further that at least 95 per cent of all persons employed be certified by the Works Progress Administration as relief cases. Moreover, emergency relief allotments to the Sugar Pine Region were made on the basis that all expenditures for purposes other than wages could not exceed $8.74 per security wage man month. These rigid restrictions materially hampered the effective operation of blister rust camps. Furthermore, at no time during the season were sufficient laborers available to maintain camp crews at full strength consistently, and the quality of the laborers assigned to the project was the poorest of the three years of operation under relief funds. As a result, turnover of labor was abnormally high with an accompanying loss of efficiency inherent in excessive changes in camp personnel. Nevertheless, progress toward the control of blister rust was made along five principal lines of work, namely, Ribes eradication, advance, regular and post-checking, reconnaissance or preeradication surveys, scouting and methods develop-

ment. Detailed reports on these projects by the persons indicated below follow:

Part II. Ribes Eradication by D. R. Miller and C. P. Wessela, Associate Foresters.

Part III. Checking by T. H. Harris, Associate Forester, and J. C. Crowell, Agent.

Part IV. Reconnaissance by C. P. Wessela, Associate Forester, and L. N. Anderson, Agent.

Part V. Scouting by S. Daryl Adams, Agent.

Part VI. Methods Development by H. R. Offord, Pathologist, C. R. Quick, Assistant Pathologist, and L. P. Winslow, Agent.

July 1, 1937

State Forester J. W. Ferguson, Jr.,
Oregon State Board of Forestry,
Salem, Oregon.

Dear Mr. Ferguson:

The Memorandum of Agreement between this Bureau and the Oregon State Board of Forestry and the Bureau of Plant Industry, Oregon State Department of Agriculture, concerning Cooperative Work in Controlling White Pine Blister Rust, contains a provision for renewal from year to year upon mutual consent of the cooperating agencies.

The Bureau is desirous that this Memorandum of Agreement be renewed for the fiscal year beginning July 1, 1937, and in a letter similar to this is so advising the other cooperating agency. If such renewal meets with the approval of your agency, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

The consummation of this renewal will, of course, be dependent upon appropriation of necessary funds for continuance of the activity. In the event of renewal, it is agreed that the expenditures for this work during the fiscal year beginning July 1, 1937, shall be approximately $11,000.00 by the Bureau of Entomology and Plant Quarantine, and a total of approximately $1,500.00, including services, by the State agencies named.

Very truly yours,

/s/ Lee A. Strong,

Chief of Bureau.

Concurred in:

/s/ J. W. Ferguson
State Forester, Oregon State Board of Forestry.

July 1, 1937

Director Frank McKennon,
Bureau of Plant Industry,
Oregon State Department of Agriculture,
Salem, Oregon.

Dear Director McKennon:

The Memorandum of Agreement between this Bureau and the Bureau of Plant Industry, Oregon State Department of Agriculture, and the Oregon State Board of Forestry, concerning Cooperative Work in Controlling White Pine Blister Rust, contains a provision for renewal from year to year upon mutual consent of the cooperating agencies.

The Bureau is desirous that this Memorandum of Agreement be renewed for the fiscal year beginning July 1, 1937, and in a letter similar to this is so advising the other cooperating agency. If such renewal meets with the approval of your agency, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

The consummation of this renewal will, of course, be dependent upon appropriation of necessary funds for continuance of the activity. In the event of renewal, it is agreed that the expenditures for this work during the fiscal year beginning July 1, 1937, shall be approximately $11,000.00 by the Bureau of Entomology and Plant Quarantine, and a total of approximately $1,500.00, including services, by the State agencies named.

Very truly yours,

/s/ Lee A. Strong,

Chief of Bureau

Concurred in:

/s/ Frank McKennon
Director, Bureau of Plant Industry,
Oregon State Department of Agriculture.

June 30, 1937

State Forester L. B. Pratt,
Division of Forestry,
California Department of Natural Resources,
Sacramento, California.

Dear Mr. Pratt:

The Memorandum of Agreement between this Bureau and the Division of Forestry of the California State Department of Natural Resources, the California State Department of Agriculture, and the College of Agriculture, Department of Botany, and Botanical Garden, University of California, concerning Cooperative Work in Controlling White Pine Blister Rust, contains a provision for renewal from year to year upon mutual consent of the cooperating agencies.

The Bureau is desirous that this Memorandum of Agreement be renewed for the fiscal year beginning July 1, 1937, and in a letter similar to this is so advising each of the other cooperating agencies. If such renewal meets with the approval of your agency, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

The consummation of this renewal will, of course, be dependent upon appropriation of necessary funds for continuance of the activity. In the event of renewal, it is agreed that the expenditures for this work during the fiscal year beginning July 1, 1937, shall be approximately $44,000.00 by the Bureau of Entomology and Plant Quarantine, and a total of approximately $10,500.00, including services, by the State agencies named.

Very truly yours,

/s/ Avery S. Hoyt,

Acting Chief of Bureau.

Concurred in:

/s/ L. B. Pratt
State Forester, Division of Forestry,
California Department of Natural Resources.

June 29, 1937

Director A. A. Brock,
California Department of Agriculture,
Sacramento, California.

Dear Director Brock:

The Memorandum of Agreement between this Bureau and the Division of Forestry of the California State Department of Natural Resources, the California State Department of Agriculture, and the College of Agriculture, Department of Botany, and Botanical Garden, University of California, concerning Cooperative Work in Controlling White Pine Blister Rust, contains a provision for renewal from year to year upon mutual consent of the cooperating agencies.

The Bureau is desirous that this Memorandum of Agreement be renewed for the fiscal year beginning July 1, 1937, and in a letter similar to this is so advising each of the other cooperating agencies. If such renewal meets with the approval of your agency, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

The consummation of this renewal will, of course, be dependent upon appropriation of necessary funds for continuance of the activity. In the event of renewal, it is agreed that the expenditures for this work during the fiscal year beginning July 1, 1937, shall be approximately $44,000.00 by the Bureau of Entomology and Plant Quarantine, and a total of approximately $10,500.00, including services, by the State agencies named.

Very truly yours,

/s/ Avery S. Hoyt,

Acting Chief of Bureau.

Concurred in:

/s/ A. A. Brock
Director, California Department of Agriculture.

June 29, 1937

Dean C. B. Hutchison,
College of Agriculture,
University of California,
Berkeley, California.

Dear Dean Hutchison:

The Memorandum of Agreement between this Bureau and the Division of Forestry of the California State Department of Natural Resources, the California State Department of Agriculture, and the College of Agriculture, Department of Botany, and Botanical Garden, University of California, concerning Cooperative Work in Controlling White Pine Blister Rust, contains a provision for renewal from year to year upon mutual consent of the cooperating agencies.

The Bureau is desirous that this Memorandum of Agreement be renewed for the fiscal year beginning July 1, 1937, and in a letter similar to this is so advising each of the other cooperating agencies. If such renewal meets with the approval of your agency, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

The consummation of this renewal will, of course, be dependent upon appropriation of necessary funds for continuance of the activity. In the event of renewal, it is agreed that the expenditures for this work during the fiscal year beginning July 1, 1937, shall be approximately $44,000.00 by the Bureau of Entomology and Plant Quarantine, and a total of approximately $10,500.00, including services, by the State agencies named.

Very truly yours,

/s/ Avery S. Hoyt,

Acting Chief of Bureau.

Concurred in:

/s/ C. B. Hutchison
Dean, College of Agriculture, University of California.

By: S. B. Freeborn.

June 30, 1937

Dr. T. H. Goodspeed, Director,
Botanical Garden, University of California,
Berkeley, California.

Dear Doctor Goodspeed:

The Memorandum of Agreement between this Bureau and the Division of Forestry of the California State Department of Natural Resources, the California State Department of Agriculture, and the College of Agriculture, Department of Botany, and Botanical Garden, University of California, concerning Cooperative Work in Controlling White Pine Blister Rust, contains a provision for renewal from year to year upon mutual consent of the cooperating agencies.

The Bureau is desirous that this Memorandum of Agreement be renewed for the fiscal year beginning July 1, 1937, and in a letter similar to this is so advising each of the other cooperating agencies. If such renewal meets with the approval of your agency, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

The consummation of this renewal will, of course, be dependent upon appropriation of necessary funds for continuance of the activity. In the event of renewal, it is agreed that the expenditures for this work during the fiscal year beginning July 1, 1937, shall be approximately $44,000.00 by the Bureau of Entomology and Plant Quarantine, and a total of approximately $10,500.00, including services, by the State agencies named.

Very truly yours,

/s/ Avery S. Hoyt,

Acting Chief of Bureau.

Concurred in:

/s/ T. H. Goodspeed
Director, Botanical Garden, University of California.

June 30, 1937

Mr. A. R. Davis, Chairman,
Department of Botany,
University of California,
Berkeley, California.

Dear Mr. Davis:

The Memorandum of Agreement between this Bureau and the Division of Forestry of the California State Department of Natural Resources, the California State Department of Agriculture, and the College of Agriculture, Department of Botany, and Botanical Garden, University of California, concerning Cooperative Work in Controlling White Pine Blister Rust, contains a provision for renewal from year to year upon mutual consent of the cooperating agencies.

The Bureau is desirous that this Memorandum of Agreement be renewed for the fiscal year beginning July 1, 1937, and in a letter similar to this is so advising each of the other cooperating agencies. If such renewal meets with the approval of your agency, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

The consummation of this renewal will, of course, be dependent upon appropriation of necessary funds for continuance of the activity. In the event of renewal, it is agreed that the expenditures for this work during the fiscal year beginning July 1, 1937, shall be approximately $44,000.00 by the Bureau of Entomology and Plant Quarantine, and a total of approximately $10,500.00, including services, by the State agencies named.

Very truly yours,

/s/ Avery S. Hoyt,

Acting Chief of Bureau.

Concurred in:

/s/ A. R. Davis
Chairman, Department of Botany,
University of California.

S
Disease Control
Blister Rust

Oakland, California
May 26, 1937

WORKING PLAN FOR THE COOPERATIVE CONDUCT OF BLISTER RUST CONTROL BY THE U. S. BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE AND THE U. S. FOREST SERVICE IN THE NATIONAL FORESTS OF CALIFORNIA

I. BASIS

1. This plan is based upon the Memorandum of Understanding of April 19, 1937 between the Bureau of Entomology and Plant Quarantine and the Forest Service.

2. Period: During the entire period the Memorandum of Understanding is in effect; specifically July 1, 1937 to June 30, 1938, or to begin whenever regular or emergency funds for blister rust control shall be made available to the Forest Service.

3. Finances:

   (a) Bureau of Entomology and Plant Quarantine - Expected regular appropriation of $46,000 for sugar pine region of which an undivided amount of approximately $35,000 is appropriately chargeable to California. Expected emergency funds of about $20,000 per month, continuing the anticipated expenditures during May and June.

   (b) Forest Service - Expected P. and A. allotment for blister rust of $40,000. Emergency allotment of about $12,000 to June 30 and expected additional allotments of emergency funds on or after July 1 of amounts which cannot now be estimated.
   One CCC camp on each of the Plumas and Eldorado forests.

4. The major work unit or "general forest area" shall be the national forest. The national forests designated for work during 1937 are those where active operations are in progress, namely, the Plumas, Eldorado, Stanislaus, and Sierra.

5. Within a national forest all large areas predominately of state and private ownership shall be allotted to the Bureau of Entomology and Plant Quarantine, and those predominantly of Federal ownership shall be allotted to the Forest Service. This type of territorial division in practice permits the distribution of land on the

basis of camp areas; i.e., camp units in predominantly Federal ownership will be assigned to the Forest Service, and those in state or private ownership to the Bureau. This is a flexible and equitable arrangement inasmuch as it permits each agency to operate on a national forest to the extent that the lands for which it is responsible are present.

6. On the present four national forests where blister rust operations are under way, the Bureau shall provide a technical supervisor and a checking supervisor for each, and the Forest Service shall provide an officer in charge of blister rust control on each. The assignment of personnel to these positions will be as follows:

Division of Personnel

	Plumas	Eldorado	Stanislaus	Sierra
Entomology & Plant Quarantine Technical Supervisor..........	Howard	Miller	Blomstrom	Patty
Entomology & Plant Quarantine Checking Supervisor..........	Adams	Crowell	Fowler	Mitchell
Forest Service Administrative Officer.....................	James	Kincaid	London	Riley

The Forest Service will pay the salaries of their four administrative officers and, reimburse the Bureau for supervision of checking done on Federal lands, by transfer of funds in an amount equivalent to the salaries and expenses, of two of the checking supervisors. The Forest Service blister rust officers will be obtained by transfer from the Bureau as provided in the Memorandum of Understanding.

7. The duties of the Bureau technical supervisor shall be as follows:

(a) To be responsible to the Bureau's regional representative for the general leadership of the entire blister rust control program on a national forest.

(b) To prepare coordinated plans for protection work on the forest in conjunction with the Forest Service, other public agencies, and private cooperators.

(c) To recommend the best methods of Ribes eradication for each control unit.

(d) To be responsible for the establishment and operation of Bureau camps and for work done therefrom.

(e) To keep himself thoroughly informed of all conditions affecting the need for and results and progress of Ribes eradication or reeradication on Federal as well as on private land.

(f) To collaborate with and advise the Forest Service administrative officer on all technical phases of control work, and to keep such officer informed of his activities and findings and recommendations as to the need for and progress and efficiency of blister rust control work on the forest.

(g) To perform preeradication and reconnaissance surveys on state and private lands, and, in conjunction with the Forest Service on national forest lands.

8. The duties of the Forest Service blister rust officer shall be as follows:

(a) To administer directly and be responsible to the Forest Supervisor for Ribes eradication conducted by Forest Service camps including the placing, construction and efficient operation of the camps.

(b) As personnel officer acting for both agencies, to fill the labor requirements of both operations by obtaining, so far as possible, local workers and assigning them to the agencies according to the number of camps of each.

(c) To collaborate with the Bureau's technical supervisor in the preparation of blister rust control plans, in which he will be aided by the field observations and counsel of the technical supervisor.

(d) To conduct preeradication and reconnaissance surveys on Federal lands in conjunction with the Bureau technical supervisor.

(e) To prepare the final detailed plan of work for actual control operations on Federal lands in harmony with the coordinated plan for the forest as a whole as advocated by the Bureau.

9. The checking supervisor shall be responsible to the Bureau's regional checking supervisor, and shall have as his duties the supervision and direction of checking work for all Bureau and Forest Service camps. When checking was entrusted a few years ago by the Bureau to a separate organization functioning independently of the eradication group, the Bureau was recognizing the principle that those who perform the eradication work should not be responsible also for the check upon their own results. A separate organization having a single objective will be more likely to perform an unbiased, reliable appraisal of conditions after Ribes eradication and can better coordinate standards of work throughout the state. Therefore, it is recommended that the present checking organization of the Bureau be continued intact as provided above and that its duties be extended to include responsibility for all checking in Forest Service camps.

The checking supervisor will also maintain continuous contact with the Forest Service administrative officer in order to insure uniformity in standards of efficiency and to assist in the interpretation of checking data.

II. FUNCTIONS AND SCOPE OF WORK OF EACH COOPERATIVE AGENCY

1. Technical responsibilities:

(a) Because the Bureau has always assumed responsibility for the investigational and technical aspects of blister rust and its control, the Bureau will continue to perform the following functions:

(1) Experimental development of methods of Ribes eradication.

(2) Disease surveys to determine the rate of progress of disease through a region and the degree of pine infection on any specified area.

(3) Definition of control standards and standards for efficient work in terms of quality and quantity.

(4) All types (advance, regular, and post) of checking on both Federal and private lands in order to supply information on the quality of eradication work and the attainment of control standards, and to determine Ribes conditions and populations before, during, and after eradication operations for the preparation of regional coordinated plans for subsequent control operations.

(5) Preparation of a unified plan of control for each national forest and for the state as a whole, in consultation with the Forest Service, state forester, and representatives of private owners.

(6) The compilation, correlation, and maintenance of records relating to the need for and the progress and results of control work on sugar pine lands of whatever ownership. This will be done at the Bureau's regional office at Oakland.

(7) In the capacity of technical advisor the Bureau will keep the Forest Service fully informed on such matters as (a) the relative urgency of areas to be worked, (b) best methods of eradication for use on specific areas, and (c) any factors affecting the technical application of control operations during their progress.

(b) Because of mutual interest, reconnaissance and pre-eradication surveys will be conducted jointly by both agencies, each bearing its share of the cost proportionate to the amount of work done on land of each class of ownership. The Bureau's technical supervisor, as general leader and coordinator of control work on a national forest, will nominally direct these surveys, although the distribution, kind, and amount of work will largely govern the type of cooperation adopted in the field.

(c) The Forest Service will finance and, through its blister rust officer, direct the field administration of its camps and the control work done therefrom and be responsible for their efficient operation. The Bureau will similarly finance, direct, and be responsible for the efficient operation of its camps. There will be times, however, when the number of camps on a national forest will be unequally divided between the agencies. If, for example, the Forest Service should have two camps and the Bureau six, the amount of routine work falling to the Bureau supervisor would be disproportionally large compared to the amount that the Forest Service officer could logically be expected to assume. In this or similar cases, direct charge of some of the Bureau camps will be given to the Forest Service officer whose responsibility for them shall be to the Bureau supervisor. For the reverse condition, the Bureau men will take charge of some Forest Service camps, acknowledging responsibility for them to the Forest Service officer.

A definite plan will be worked out by the Bureau technical supervisor and the Forest supervisor of each national forest that will provide a solution for problems of camp operation and control work involving both agencies, and that by assigning camps as outlined above will provide a fair division of work between the two blister rust supervisors. All aspects of the cooperative work on a forest that need clarification or special handling will be included in the plan. This plan should also recognize the principle that someone must head the work on a forest, must act as coordinator of all blister rust activities; as general leader of control work, this man should logically be the Bureau technical supervisor, who will then feel himself as much responsible for the successful completion of the Forest Service work as for that of the Bureau.

This evokes the question of how closely the two supervisors should work together. Where the very men administering the Forest Service job were obtained from the Bureau, and are assigned to the same forests claiming them before as Bureau employees, and where they now find themselves cooperating with their former supervisors (the Bureau technical supervisors), these men will

naturally continue from habit to look to the Bureau supervisors for guidance in conducting the Forest Service program. There is every reason, therefore, to believe that the best cooperation, interchange of duties, and mutual assistance will exist between the men of the Bureau and of the Forest Service. This will result in bringing the two operations closer together than the Memorandum of Understanding would indicate, which is much to be desired when the disadvantages of the camp area plan are considered. If the two operations can work in harmony and have similar objectives, most of the disadvantages will disappear. Furthermore, inasmuch as the Bureau supervisor is charged with general leadership of the blister rust program on the forest and with responsibility for a unified program of control, his previous relation to the Forest Service administrative officer will simplify his task; the probability of having two men of equal authority in closely related fields quibbling over administrative matters is lessened. Although two organizations will be doing similar work in the same locality, in practice the work will appear to be administered as one project with one leader responsible. Other parts of the project that will be assigned to one or the other agency in the interest of economy or better management will be touched upon below.

(d) It shall be the responsibility of the Forest Service to contact owners of private property and request permission to conduct control work thereon, and, where necessary, request permission to locate camps thereon.

(e) In order that the data and maps composing the record of work may be compiled on the same basis and presented similarly in reports of accomplishments, that working plans may be correlated, that the many aspects of control may be discussed and studied in a purposeful manner without duplication of conferences and a waste of time, all supervisory personnel should be quartered at one central office during the winter. Inasmuch as the present regional office of the Bureau at Oakland is the logical headquarters (where all records are now gathered), the Forest Service will detail its administrative officers there for winter work. In view of the obvious advantages of having the regional offices of the cooperating agencies close together, it would be advisable to consider the possibility of moving the Bureau office from its present location in Oakland to San Francisco, where space can be obtained in the building occupied by the Forest Service.

(f) All members of the blister rust control operation of both Forest Service and Bureau camps shall abide by all Forest Service regulations concerning personal conduct on the National Forest. These regulations include restrictions on smoking in the woods, speed regulations of trucks on roads and any other regulations issued for the benefit of the general public.

(g) The Forest Supervisor will consider the blister rust camp personnel of both Forest Service and Bureau camps as a part of his emergency fire suppression organization and acquaint the camp foreman with regulations governing fire duties in this connection. During especially hazardous periods a part or all of the camp personnel may be held in camp over week-ends for emergency fire duty.

Blister rust personnel called for fire duty will be returned to their regular duties as soon as they can be replaced or as soon as the fire is under control.

The procedure in effect during 1936 relating to use of Bureau ERA workers on fire will apply.

2. Temporary personnel and labor:

(a) Supervisory personnel and checkers:

(1) The Bureau will hire and pay the salaries of all supervisory personnel and checkers necessary to administer its camps, and the Forest Service similarly will employ the supervisory personnel for its camps. Checkers for the Forest Service camps, if paid by the Forest Service, will be selected jointly and will be acceptable to both agencies, inasmuch as in their work they will be directed by and responsible to the Bureau checking supervisors. By mutual agreement checkers for Forest Service camps may be provided by the Bureau with appropriate reimbursement to the Bureau. If desirable the Bureau will assist the Forest Service with the employment of its personnel, the Bureau having a complete file of all persons with blister rust experience.

The Bureau and Forest Service will hire whatever extra temporary personnel are needed to properly conduct field operations the cost of such service to be prorated equitably between agencies. This will include such positions as a warehouseman for a jointly operated warehouse, a mechanic for the Forest Service shop-garage, the necessary field clerks, and any other necessary persons.

(b) Labor:

(1) Each agency will pay the wages of the laborers employed in its camps. In the past suitable relief labor has been scarce, and even if the open market is to be drawn upon, labor should be procured under a joint arrangement in order to assure its equitable distribution to the camps of both agencies. Otherwise, competition will ensue, which will result in friction should

one agency be more successful than the other in obtaining workers. Therefore, the Forest Service blister rust officer will be charged with the duty of procuring local workers and assigning them to the agencies in proportion to the number of camps of each. The interests of the Forest Service and the Bureau will thus be represented by one man, who will conduct all business relating to local labor with outside organizations. The obtaining of workers from the San Francisco Bay region and the large cities of the state will be handled by the two regional offices, which will assign the workers as described above. Rates of pay, hours of work, and board deductions should be uniform for all workers of the same classification employed by either agency and steps are being taken to bring this about.

3. Project operation and supply:

(a) In general each agency will finance its own camps, all control work done therefrom, and all work for which it is definitely responsible unless otherwise provided in this working plan. Thus each agency will finance the construction of its camps, the subsistence of its personnel, and the purchase of its own camp and automotive equipment, although the procurement of these items for the entire project may be assigned to either of the agencies as herein provided in order to achieve economy in the cost of operation, expeditious handling of supply services, and to avoid the duplication of work in the handling of these services.

(b) Each agency will procure its own camp construction supplies and camp and automotive equipment, and will direct the construction of its own camps. If it is advantageous to purchase any of these groups of materials under one contract for a national forest or for the state, this may be done if mutually agreed, reimbursement being made the purchasing agency for the other's share. Inasmuch as the number of camps of each agency will fluctuate from year to year, depending upon the status of ownerships involved in the work areas, provision should be made for the interchange of equipment in order to avoid the necessity of each agency's stocking sufficient equipment for a peak season. Therefore, surplus blister rust equipment of either agency will be lent the other in complete camp units, and will ordinarily not be broken into groups of separate items. Separation of ownership will be carefully maintained. At the close of each season's work loaned equipment will be returned and any necessary adjustments made.

(c) In order that the funds of each agency may be expended correctly in a ratio corresponding to the number of persons employed, it is advisable that the procurement of subsistence supplies for all camps on a national forest be purchased under Forest Service contracts, and all supplies handled through a central Forest Service warehouse for each Forest. In order to determine that each Bureau is financing its proportionate share of subistence expenses, the following procedure will be adopted:

(1) Issues from the central warehouse will be covered by standard Forest Service invoice, Form 634.

(2) Form 634 will be entered in the accounting records as a liability against the Bureau receiving the supplies.

(3) The Forest Service will designate the Bureau which will finance current purchases from the warehouse record of issues, which establish liability.

(4) Payments of subsistence supplies will be entered in the warehouse account as credits to the Bureau making payment, in order to balance the liabilities incurred through warehouse issues.

(5) The Forest Service will enter payments in the warehouse account by both Bureaus, by paid copies of vouchers, which will necessitate the Division of Plant Disease Control sending copies of paid subsistence vouchers to the Forest concerned. The Forest Service will in turn transmit to Plant Disease Control a copy of all subsistence vouchers paid from the warehouse subsistence account.

(6) Plant Disease Control will furnish each Forest a block of their purchase orders which will be used when the Forest obligates their funds. A copy of each purchase order obligating Plant Disease Control funds will immediately be furnished Plant Disease Control for their information. Invoices to be paid by Plant Disease Control will be receipted by the Forest Service and immediately forwarded to Plant Disease Control for payment. At the termination of the field season an adjustment voucher covering the balance due either agency would be prepared and a transfer of funds made.

Since the Bureau is responsible for the maintenance of records, all Forest Service cost records of blister rust control expenses will be maintained separately from other Forest Service activities and will be available for Bureau use for the preparation of reports.

(d) The Forest Service will furnish office space at the Forest Supervisor's headquarters for the Bureau technical supervisor and his staff and the Forest Service blister rust officer and his assistants, and warehouse space for the storage of camp equipment of both the Bureau and the Forest Service throughout the winter. The Forest Service will also furnish a supply warehouse for field season use (for storage and handling of subsistence supplies), refrigeration facilities if at all possible, the use of a garage and shop when it will not conflict with other Forest Service uses, and telephone service local and intercamp where such is established. The Forest Service will make current repairs on Bureau trucks. Where space facilities are not available in Forest Service quarters, the Bureau will pay rental of space hired for its own use, or a proportional share of the rental of space jointly occupied.

(e) Intangible services can be offset by intangible services whenever possible. Any distinct service not offset by a compensating one of the cooperating agency can be evaluated and offset by an equivalent service with the understanding that blister rust control is one job under the cooperative management of two Government agencies, and although an effort will be made to divide the expenses of the joint operation as equitably as possible it is agreed that a strict recompense in dollars and cents is impracticable.

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
Division of Plant Disease Control

By W. V. Benedict
Senior Forester

UNITED STATES FOREST SERVICE, REGION FIVE
Division of Timber Management

By T. D. Woodbury
Assistant Regional Forester

TABLE NO. 1

SUMMARY OF ALL RIBES ERADICATION DURING 1937 BY NUMBER OF WORKING

State	First Working			Second Working			Third Working			Fourth Working			Totals			Percentage Acreage Worked				Per Acre							
																				Ribes				Man Days			
																				Number of Workings							
	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
California	24,630	7,516,085	38,012	10,892	856,107	8,441	882	39,894	422	4,232	90,735	1,397	40,636	8,502,821	48,272	1.13	.49	.04	.19	305	79	45	21	1.54	.77	.48	.33
Oregon	2,421	645,576	1,874	18,833	378,173	2,524	-	-	-	-	-	-	21,254	1,023,749	4,398	.40	3.01	-	-	267	20	-	-	1.03	.18	-	-
Total	27,051	8,161,661	39,886	29,725	1,234,280	10,965	882	39,894	422	4,232	90,735	1,397	61,890	9,526,570	52,670	.99	1.09	.04	.19	302	41	45	21	1.47	.37	.48	.33

TABLE NO. 1A

SUMMARY OF ALL RIBES ERADICATION BY NUMBER OF WORKING, (1923 - 1937 INCLUSIVE)

State	Total Acreage White Pine	Acreage White Pine Worth Protection	Acreage Control Areas White Pine Plus Zones	First Working			Second Working			Third Working			Fourth Working			Totals			Percentage Acreage Worked				Per Acre							
																							Ribes				Man Days			
																							Number of Workings							
				Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
California	*3,051,568	**2,186,662	***2,186,662	464,953	64,768,845	240,592	41,087	3,994,696	17,394	5,775	180,597	2,112	4,318	91,312	1,409	516,133	69,035,450	261,507	21.26	1.38	.26	.20	139	97	31	21	.52	.42	.36	.33
Oregon	444,562	444,562	540,764	117,378	11,085,656	29,322	27,641	733,875	5,192	244	115,168	398	-	-	-	145,263	11,934,699	34,912	21.70	5.11	.04	-	95	26	472	-	.25	.19	1.63	-
Total	3,496,130	2,631,224	2,727,426	582,331	75,854,501	269,914	68,728	4,728,571	22,586	6,019	295,765	2,510	4,318	91,312	1,409	661,396	80,970,149	296,419	21.35	2.52	.22	.20	130	69	49	21	.46	.33	.42	.33

* Includes 1,449,235 acres sugar pine type outside control units.
** Includes 582,128 acres non-sugar pine type interspersed with sugar pine type within control units; figure given represents total area of control units.
*** Control units as set up include protective zones.

Note: The acreage of white pine worth protection has been enlarged to include a control unit of 11,660 acres on the Mt. Lassen National Park.

TABLE NO. 2

SUMMARY OF RIBES ERADICATION DURING 1937 BY PROGRAMS

State	Total Acreage Worked First, Second, Third, and Fourth	Regular and Cooperative			WPA and ERA			ECT and CCC			Total Emergency Programs (WPA and CCC)		
		Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days
California	40,636	-	-	-	38,150	7,951,789	44,499	*2,486	551,032	**3,773	40,636	8,502,821	48,272
	Percentage of Total Acreage Worked		-			93.8%			6.2%			100.0%	
Oregon	21,254	-	-	-	20,109	903,836	4,022	1,145	119,913	376	21,254	1,023,749	4,398
	Percentage of Total Acreage Worked		-			94.6%			5.4%			100.0%	
Total	61,890	-	-	-	58,259	8,855,625	48,521	3,631	670,945	4,149	61,890	9,526,570	52,670
	Percentage of Total Acreage Worked		-			94.1%			5.9%			100.0%	

* Includes 25 acres bulldozer work on R. inerme-willow slashing.
** Includes 157 8-hour man days on bulldozer work.

TABLE NO. 2A

SUMMARY OF ALL RIBES ERADICATION BY PROGRAMS, (1923 - 1937 INCLUSIVE)

State	Total Acreage Worked First, Second, Third, and Fourth	Regular and Cooperative			WPA and ERA			ECW and CCC			PWA and NRA			Total Emergency Programs (WPA - CCC - PWA)			Total		
		Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Acreage Worked	Number Wild Ribes Destroyed	Number 8-Hour Man Days
California	516,133	51,166	1,800,001	8,206	232,920	42,849,610	159,965	22,893	3,000,488	20,457	209,154	21,385,351	72,879	464,967	67,235,449	253,301	516,133	69,035,450	261,507
	Percentage of Total Acreage Worked		9.9%			45.1%			4.4%			40.6%			90.1%			100.0%	
Oregon	145,263	4,781	385,772	3,077	108,573	8,633,138	22,464	1,145	119,913	376	30,764	2,795,876	8,995	140,482	11,548,927	31,835	145,263	11,934,699	34,912
	Percentage of Total Acreage Worked		3.3%			74.7%			0.8%			21.2%			96.7%			100.0%	
Total	661,396	55,947	2,185,773	11,283	341,493	51,482,748	182,429	24,038	3,120,401	20,833	239,918	24,181,227	81,874	605,449	78,784,376	285,136	661,396	80,970,149	296,419
	Percentage of Total Acreage Worked		8.5%			51.6%			3.6%			36.3%			91.5%			100.0%	

TABLE NO. 3

SUMMARY OF ALL OTHER CONTROL WORK DURING 1937

State	Checking						Preeradication Survey		Cultivated Black Current Eradication			
	Advance		Post		Regular							
	Acreage Checked	Number 8-Hour Man Days	Acreage Checked	Number 8-Hour Man Days	Acreage Checked	Number 8-Hour Man Days	Number Acres Mapped by Reconnaissance	Number 8-Hour Man Days	Number Inspections Made	Number Locations Made	Number Cultivated Black Currants Destroyed	Number 8-Hour Man Days
California	4,079	79	28,195	318	42,500	1,114	-	-	*28	28	47	30
Oregon	5,700	73	23,443	306	6,947	196	78,575	293	-	-	-	-
Total	9,779	152	51,638	624	49,447	1,310	78,575	293	*28	28	47	30

* Data Incomplete

TABLE NO. 3A

SUMMARY OF ALL OTHER CONTROL WORK, (1923 - 1937 INCLUSIVE)

State	Cultivated Black Currant Eradication				Nursery Sanitation				Preeradication Survey		***Treatment Infected White Pine				
	Number Inspections Made	Number Locations Found	Number Cultivated Black Currants Destroyed	Number 8-Hour Man Days	Number Nurseries Worked	Acreage in Nursery Control Areas	Number Wild Ribes Destroyed	Number 8-Hour Man Days	Number Acres Mapped by Reconnaissance	Number 8-Hour Man Days	Number Trees Examined	Number Trees Treated	Number Trees Removed	Number Cankers Removed	Number 8-Hour Man Days
California	**3,298	657	8,621	2,182	-	-	-	-	1,088,130	3,400	35,000	-	9	-	221
Oregon	*	1,671	52,202	*	2	772	15,500	**224	346,036	1,332	1,316	-	247	-	252
Total	3,298	2,328	60,823	2,182	2	772	15,500	224	1,434,166	4,732	36,316	-	256	-	473

* No data available.
** Data incomplete.
*** Includes scouting project; data available for 1936 only.

TABLE NO. 4

SUMMARY OF RIBES ERADICATION WORK ON NATIONAL FOREST LANDS, (1932 - 1937 INCLUSIVE)

Sugar Pine Region	Acreage of National Forest Land in Control Area	Calendar Year	Acreage Covered by Ribes Eradication: Forest Service First Working	Forest Service Second Working	Forest Service Third Working	Forest Service Fourth Working	Bureau First Working	Bureau Second Working	Bureau Third Working	Bureau Fourth Working	Total Acreage Worked by Both Agencies: First Working	Second Working	Third Working	Fourth Working	Accumulative Totals: First Working	Second Working	Third Working	Fourth Working	Total Acreage Worked to Date - First, Second, Third, and Fourth Workings	Unworked Acreage
									CALIFORNIA											
National Forests	998,768	Up to 1932	-	-	-	-	11,318	6,675	-	-	11,318	6,675	-	-	11,318	6,675	-	-	17,993	
		1933	16,343	1,660	4,213	-	-	-	-	-	16,343	1,660	4,213	-	27,661	8,335	4,213	-	40,209	
Eldorado		1934	94,153	1,455	-	-	-	-	-	-	94,153	1,455	-	-	121,814	9,790	4,213	-	135,817	
Klamath		1935	-	-	-	-	30,435	1,135	-	-	30,435	1,135	-	-	152,249	10,925	4,213	-	167,387	
Lassen		1936	-	-	-	-	44,144	9,927	-	19	44,144	9,927	-	19	196,393	20,852	4,213	19	221,477	
Mendocino		1937	8,847	2,480	-	-	5,970	3,508	602	3,952	14,817	5,988	602	3,952	211,210	26,840	4,815	3,971	246,836	787,558
Plumas																				
Sequoia																				
Shasta																				
Sierra																				
Stanislaus																				
Tahoe																				
Trinity																				
									OREGON											
National Forests	265,512	Up to 1932	-	-	-	-	2,948	670	-	-	2,948	670	-	-	2,948	670	-	-	3,618	
		1933	-	-	-	-	5,953	129	-	-	5,953	129	-	-	8,901	799	-	-	9,700	
Mt. Hood		1934	480	-	-	-	8,608	1,258	244	-	9,088	1,258	244	-	17,989	2,057	244	-	20,290	
Rogue River		1935	-	-	-	-	10,765	6,465	-	-	10,765	6,465	-	-	28,754	8,522	244	-	37,520	
Siskiyou		1936	42	85	-	-	12,030	-	-	-	12,072	85	-	-	40,826	8,607	244	-	49,677	
Siuslaw - (Mt. Hebo plantation only)		1937	-	-	-	-	1,231	8,619	-	-	1,231	8,619	-	-	42,057	17,226	244	-	59,527	223,455
Umpqua																				

TABLE NO. 5

SUMMARY OF EXPENDITURES FOR SUGAR PINE REGION FOR 1937

Federal Expenditures		Recapitulation: By Programs: Regular and Cooperative	Emergency Program WPA and ERA	By Activities: Supervision Includes State and District Leaders	Ribes Eradication	Cultivated Black Currant Eradication	Nursery Sanitation	Canker Elimination	Pre-eradication Survey	All Other Checking, Field Data and Miscellaneous
CALIFORNIA										
Bureau	$287,881.18	$31,499.79	$256,381.38	$44,516.61	$183,799.88	$240.00	-	-	-	$59,324.68
Forest Service	97,627.42	8,895.80	88,731.62	6,627.65	85,883.13	-	-	-	-	5,116.64
Total	385,508.59	40,395.59	345,113.00	51,144.26	269,683.01	240.00	-	-	-	64,441.32
OREGON										
Oregon	51,080.12	3,454.74	47,625.38	8,380.22	33,030.32	-	-	-	$3,974.05	5,695.53
TOTAL FOR REGION										
Total	$436,588.71	$43,850.33	$392,738.38	$59,524.48	$302,713.33	$240.00	-	-	$3,974.05	$70,136.85

TABLE NO. 5A

SUMMARY OF ALL EXPENDITURES FOR SUGAR PINE REGION, 1923-1937 INCLUSIVE

Total Federal Expenditures	Recapitulation: By Programs: Regular and Cooperative	Emergency Program WPA and ERA	PWA	Total Emergency Program WPA and PWA	By Activities: Supervision Includes State and District Leaders	Ribes Eradication	Cultivated Black Currant Eradication	Nursery Sanitation	Canker Elimination	Pre-eradication Survey	All Other Checking, Field Data and Miscellaneous
CALIFORNIA											
$2,278,892.60	$734,411.63	$1,148,042.94	$396,438.03	$1,544,480.97	$384,580.47	$1,406,908.89	$39,904.58	$ 1,315.99	-	$51,158.30	$395,024.37
OREGON											
555,742.57	228,046.10	238,189.20	89,507.27	327,696.47	37,834.35	311,303.06	36,894.79	15,835.51	$2,268.00	19,803.27	131,803.59
TOTAL FOR THE REGION											
$2,834,635.17	$962,457.73	$1,386,232.14	$485,945.30	$1,872,177.44	$422,414.82	$1,718,211.95	$76,799.37	$17,151.50	$2,268.00	$70,961.57	$526,827.96

TABLE NO. 6

NUMBER AND SIZE OF CAMPS ENGAGED IN RIBES ERADICATION LISTED BY PROGRAM, SUGAR PINE REGION, 1925-1937

PART A: California

Year	Unit or Forest	Number and Size of Camps by Program				Agency Furnishing Funds
		Regular	CCC	NIRA	WPA	
1926	Stanislaus	1-20 Man				Bureau of Plant Industry
1927	"	1-24 "				" " " "
1928	"	1-28 "				" " " "
1929	Plumas	1-15 "				
		1-20 "				" " " "
1930	Stanislaus	1-20 "				" " " "
1931	Lassen	1-15 "				
		1-20 "				" " " "
1932	Stanislaus	1-15 "				" " " "
1933	Stanislaus		1-125 Man			Forest Service
			1- 25 "			" "
			1- 44 "			" "
				1-75 Man		Bureau of Plant Industry*
				5-50 "		" " " "
				2-25 "		" " " "
	Eldorado		1-35 Man			Forest Service
	Plumas		1-50 "			" "
			1-100 "			" "
	Calaveras		1-16 "			State of California
	State Park			1-50 Man		Bureau of Plant Industry
	Yosemite					
	Nat. Park		1-50 Man			National Park Service
1934	Stanislaus		1-15 "			Forest Service
				10-25 Man		Bureaus** & Forest Service
				4-30 "		" " " "
	Eldorado			3-25 "		Bureaus & Forest Service
				9-30 "		" " " "
	Plumas			5-50 "		" " " "
				2-75 "		" " " "
	Yosemite		1-15 Man			National Park Service
1935	Plumas				6-75 Man	Bureau of E. & P. Q.
	Eldorado				5-75 "	" " " " "
	Stanislaus				3-75 "	" " " " "
					1-150 "	" " " " "
	Sierra				5-75 "	" " " " "
					1-100 "	" " " " "
1936	Plumas				5-75 "	" " " " "
					1-20 "	" " " " "
	Eldorado				4-75 "	" " " " "
					1-45 "	" " " " "
	Stanislaus				4-75 "	" " " " "
					1-150 "	" " " " "
					1-20 "	" " " " "
	Sierra				5-75 "	" " " " "
					1-20 "	" " " " "
	Calaveras				1-25 "	" " " " "

* Forest Service reimbursed the Bureau of Plant Industry for all work done on National Forest lands.

** Bureaus = Bureau of Plant Industry prior to July 1, 1934 and Bureau of Entomology and Plant Quarantine after July 1, 1934.

TABLE NO. 6 (Concluded)

NUMBER AND SIZE OF CAMPS ENGAGED IN RIBES ERADICATION LISTED BY PROGRAM, SUGAR PINE REGION, 1925-1937

PART A: California

Year	Unit or Forest	Number and Size of Camps by Program				Agency Furnishing Funds
		Regular	ECW	NIRA	WPA	
1937	Plumas		1-80 Man			Forest Service
					1-100 Man	" "
	Eldorado		1-60 Man			" "
					1-100 Man	" "
					2-100 "	Bureau of E. & P. Q.
					1-125 "	" " " "
	Stanislaus				1-100 "	Forest Service
					2-100 "	Bureau of E. & P. Q.
					1-125 "	" " " " "
	Sierra				2-100 "	Forest Service
					1-50 "	" "
					1-150 "	Bureau of E. & P. Q.

PART B: Oregon

Year	Unit or Forest	Number and Size of Camps by Program				Agency Furnishing Funds
		Regular	CCC	NIRA	WPA	
1925	Rogue River	1-15 Man				Bureau of Plant Industry
1927	Rogue River	1-10 "				" " " "
	Mt. Hood	1-15 "				" " " "
1929	Mt. Hood	1-15 "				" " " "
1930	Mt. Hood	1-15 "				" " " "
1931	Mt. Hood	1-25 "				" " " "
1933	Rogue River			2-25 Man		" " " "
1934	Rogue River			3-32 "		Bureau of Plant Industry & Bureau of E. & P. Q.
	Mt. Hood			1-32 "		" " " " "
	Suislaw			1-10 "		Forest Service
1935	Rogue River				6-75 Man	Bureau of E. & P. Q.
1936	Rogue River				3-60 "	" " " "
					2-50 "	" " " "
	Suislaw				1-12 "	Resettlement Administration
1937	Rogue River				1-30 "	Bureau of E. & P. Q.
					1-75 "	" " " "
	Crater Lake		1-15 Man			National Park Service

TABLE NO. 7

CLASSIFIED BUREAU EXPENDITURES BY APPROPRIATIONS AND PROJECTS

Sugar Pine Region - January 1 to December 31, 1937

Item	Appropriation	Plumas	Sierra	Eldorado	Stanislaus	Oakland Office and Indirect Charges	California Scouting	*Methods Unit	Sub-Totals	Oregon	Totals
Salaries:	EQ-Regular	$ 2,724.93	$ 3,787.17	$ 4,283.22	$ 4,499.88	$ 11,202.34	$ 1,925.00	$ 11,205.56	$ 39,628.10	$ 3,454.74	$ 43,082.84
Permanent	Emerg.-001089	-	-	-	-	-	-	-	-	2,542.26	2,542.26
Employees	" -201085	1,427.93	2,058.27	2,058.27	1,516.62	2,728.12	-	-	9,789.21	433.32	10,222.53
	" -501082	799.98	-	1,299.96	1,299.96	2,038.32	-	-	5,438.22	1,949.90	7,388.12
	Admin.-501009	-	-	-	-	866.64	-	-	866.64	-	866.64
Total - - - - - - - - - - -		4,952.84	5,845.44	7,641.45	7,316.46	16,835.42	1,925.00	11,205.56	55,722.17	8,380.22	64,102.39
Salaries:	EQ-Regular	-	-	-	-	28.00	1,656.65	550.00	2,234.65	-	2,234.65
Temporary	Emerg.-001089	-	-	-	-	-	-	-	-	-	-
Employees	" -201085	8.05	15,780.10	8,368.97	9,224.86	12,786.83	362.88	1,188.27	47,719.96	13,645.58	61,365.54
	" -501082	-	18,833.47	34,458.94	28,107.76	11,556.96	782.88	759.78	94,499.79	17,185.03	111,684.82
	Admin.-501009	-	-	-	-	-	-	-	-	-	-
Total - - - - - - - - - - -		8.05	34,613.57	42,827.91	37,332.62	24,371.79	2,802.41	2,498.05	144,454.40	30,830.61	175,285.01
Equipment:	EQ-Regular	111.75	111.75	111.75	111.75	552.02	-	273.01	1,272.03	-	1,272.03
Non and Semi	Emerg.-001089	-	-	-	-	61.20	-	-	61.20	409.54	470.74
Expendable	" -201085	65.47	207.52	90.84	82.95	571.67	-	-	1,018.45	5.75	1,024.20
	" -501082	631.90	777.57	758.11	758.12	980.59	-	-	3,906.29	1,074.40	4,980.69
	Admin.-501009	-	-	-	-	552.50	-	-	552.50	-	552.50
Total - - - - - - - - - - -		809.12	1,096.84	960.70	952.82	2,717.98	-	273.01	6,810.47	1,489.69	8,300.16
Subsistence	EQ-Regular	-	-	-	-	-	-	-	-	-	-
Supplies:	Emerg.-001089	-	260.15	-	-	-	-	-	260.15	466.82	726.97
	" -201085	-	5,239.62	5,321.38	6,674.03	-	-	-	17,235.03	2,135.36	19,370.39
	" -501082	-	8,277.39	15,557.40	13,870.50	-	463.94	-	38,169.23	4,430.05	42,599.28
	Admin.-501009	-	-	-	-	-	-	-	-	-	-
Total - - - - - - - - - - -		-	13,777.16	20,878.78	20,544.53	-	463.94	-	55,664.41	7,032.23	62,696.64
Misc. Supplies	EQ-Regular	-	-	-	-	-	19.00	161.73	180.73	-	180.73
and Other	Emerg.-001089	-	3.61	-	26.33	-	-	-	29.94	894.97	924.91
Expenses:	" -201085	231.13	1,975.82	1,160.82	1,218.16	6,921.97	6.82	84.52	11,599.24	841.07	12,440.31
	" -501082	41.96	1,241.10	1,147.56	855.47	1,480.23	19.85	86.32	4,872.49	666.34	5,538.83
	Admin.-501009	-	-	-	-	2,682.00	-	-	2,682.00	-	2,682.00
Total - - - - - - - - - - -		273.09	3,220.53	2,308.38	2,099.96	11,084.20	45.67	332.57	19,364.40	2,402.38	21,766.78
Transportation	EQ-Regular	-	-	-	-	-	374.58	362.65	737.23	-	737.23
and Travel:	Emerg.-001089	13.60	117.68	4.94	4.95	45.92	19.73	-	206.82	833.72	1,040.54
	" -201085	2,261.60	2,869.72	3,158.74	2,951.35	1,569.07	286.67	296.04	13,393.19	847.16	14,240.35
	" -501082	310.46	1,590.10	2,290.34	1,906.51	957.08	409.87	100.08	7,564.44	1,023.38	8,587.82
	Admin.-501009	-	-	-	-	-	-	-	-	-	-
Total - - - - - - - - - - -		2,585.66	4,577.50	5,454.02	4,862.81	2,572.07	1,090.85	758.77	21,901.68	2,704.26	24,605.94
Totals by	EQ-Regular	2,836.68	3,898.92	4,394.97	4,611.63	11,782.36	3,975.23	12,552.95	44,052.74	3,454.74	47,507.48
Appropriation:	Emerg.-001089	13.60	381.44	4.94	31.28	107.12	19.73	-	558.11	***5,147.31	5,705.42
	" -201085	3,994.18	28,131.05	20,159.02	21,667.97	24,577.66	656.37	1,568.83	**100,755.08	17,908.24	118,663.32
	" -501082	1,784.30	30,719.63	55,512.31	46,798.32	17,013.18	1,676.54	946.18	154,450.46	26,329.10	180,779.56
	Admin.-501009	-	-	-	-	4,101.14	-	-	4,101.14	-	4,101.14
Grand Totals - - - - - - -		$ 8,628.76	$ 63,131.04	$ 80,071.24	$ 73,109.20	$ 57,581.46	$ 6,327.87	$ 15,067.96	$ 303,917.53	$ 52,839.39	$ 356,756.92

* Accounting records maintained at Oakland office, but expenditures apply to Northwestern Region as well as Sugar Pine Region.

** Includes cash collection of $968.40 for sale to Plumas National Forest of subsistence supplies purchased in 1936 and reported with expenditures for that year.

*** Includes cash collection of $1,759.27 for sale to C.C.C. at Medford, Oregon of subsistence supplies purchased in 1936 and reported with expenditures for that year.

TABLE NO. 8

CLASSIFIED FOREST SERVICE EXPENDITURES BY APPROPRIATIONS AND PROJECTS*
SUGAR PINE REGION, JANUARY 1 - DECEMBER 31, 1937

Item	Appropriation	Plumas	Sierra	Eldorado	Stanislaus	Scouting	Total
Salaries: Permanent Employees	P & A - Regular	$ 1,614.19	$ 2,553.54	$ 1,299.96	$ 1,159.96	$ 866.64	$ 7,494.29
	Emergency WPA	-	-	-	383.32	-	383.32
Total - - - - - - - - - - - - - -		1,614.19	2,553.54	1,299.96	1,543.28	866.64	7,877.61
Salaries: Temporary Employees	P & A - Regular	-	-	642.30	-	-	642.30
	Emergency WPA	10,277.51	25,788.57	7,880.31	6,736.26	-	50,682.65
Total - - - - - - - - - - - - - -		10,277.51	25,788.57	8,522.61	6,736.26	-	51,324.95
Equipment: Non and Semi-Expendable	P & A - Regular	-	-	-	-	-	-
	Emergency WPA	-	1,308.50	-	-	-	1,308.50
Total - - - - - - - - - - - - - -		-	1,308.50	-	-	-	1,308.50
Subsistence Supplies:	P & A - Regular	-	-	-	278.39	-	278.39
	Emergency WPA	3,400.94	15,797.12	4,475.93	3,605.57	-	27,279.56
Total - - - - - - - - - - - - - -		3,400.94	15,797.12	4,475.93	3,883.96	-	27,557.95
Misc. Supplies and Other Expenses:	P & A - Regular	258.39	-	-	4.33	-	262.72
	Emergency WPA	159.59	2,122.14	134.39	137.29	-	2,553.41
Total - - - - - - - - - - - - - -		417.98	2,122.14	134.39	141.62	-	2,816.13
Transportation and Travel:	P & A - Regular	-	-	146.83	4.95	66.32	218.10
	Emergency WPA	1,746.19	3,324.98	1,105.02	347.99	-	6,524.18
Total - - - - - - - - - - - - - -		1,746.19	3,324.98	1,251.85	352.94	66.32	6,742.28
Totals by Appropriations	P & A - Regular	1,872.58	2,553.54	2,089.09	1,447.63	932.96	8,895.80
	Emergency WPA	15,584.23	48,341.31	13,595.65	11,210.43	-	88,731.62
Grand Totals - - - - - - - - - -		$ 17,456.81	$ 50,894.85	$ 15,684.74	$ 12,658.06	$ 932.96	$ 97,627.42

* This table is based upon figures furnished by the national forests concerned plus reimbursements made by the Regional Office from their regular funds for salaries and expenses of three Bureau men to prorate the cost of checking supervision of the Forest Service eradication work.

W-2294 - MATURE SUGAR PINE TYPE SHOWING STAND OF UNEVEN AGE CLASSES IN TYPICALLY OPEN STANDS.

W-2256 - OLD CUT OVER LANDS SHOWING EXCELLENT RESTOCKING OF SUGAR PINE AFTER LOGGING.

PART II

RIBES ERADICATION

By

Douglas R. Miller and Conrad P. Wessela,
Associate Foresters

INTRODUCTION

The status of Ribes eradication work in the Sugar Pine Region at the close of field work in 1937 is shown in Table No. 1, where results are summarized by national forests, national parks, and state parks for both Oregon and California, as well as for the region as a whole. Of the 2,727,426 acres included in the control units of the Sugar Pine Region, 582,331 acres or 21 per cent have received initial treatment to date. These data are expressed graphically in Charts Nos. 1 and 2. In Charts Nos. 3 and 4 the data are recapitulated to show status of control on the basis of land ownership.

The number, location, and period of operation of blister rust control camps for both the Bureau of Entomology and Plant Quarantine and the Forest Service are shown in Table No. 2. During the peak of the season there were approximately 900 men employed in Bureau ERA Camps, 600 in Forest Service ERA Camps, and 150 in three CCC Camps, or a total of 1,650 men engaged on Ribes eradication. Except for one of the Bureau camps on the Sierra National Forest, all eradication work was terminated during October.

ORGANIZATION AND ADMINISTRATION

The regular supervisory organization for each of the principal blister rust operations in the Sugar Pine Region consists of three permanent positions. For each of the four California operations these positions are the Bureau's operation and checking supervisors and the Forest Service blister rust officer. In Oregon, where the Forest Service did no work during 1937, the Bureau maintained three full time blister rust technicians. In addition to these regular staff positions, one temporary appointee was employed during the summer months at each field headquarters to assist the operation supervisor.

The duties of the regular personnel and the division of responsibility between Bureau and Forest Service officers were as outlined in the cooperative agreement which precedes this report. The division of responsibility in the administration of camps of both agencies is likewise indicated in the cooperative agreement.

Field headquarters for the Oregon operation were maintained during the entire year at Medford, and temporary offices for the California operations were maintained for the duration of the field season at the national forest headquarters in Quincy, Placerville, Sonora, and North Fork, California.

Because of rigid restrictions governing expenditures under ERA funds, and the requirements of maintaining the 95 to 5 ratio of security wage workers to other than security wage workers, it was not practical for either the Bureau or the Forest Service to operate less than 100-man camps.

The personnel of the average 100-man camp was as follows:

Employment Status	Number of Persons	Position	Classification	Monthly Wage California	Monthly Wage Oregon
Appointees	1	Superintendent	SP-6	$166.66	166.66
	1	Supervisory Cook and Baker	CU-5	125.00	125.00
	2	Checkers	SP-3	120.00	120.00
Security Wage Workers (Relief)	4	Assistant Camp Superintendents	Prof.	61.20	75.60
	2	Cooks	Skilled	55.20	69.96
	1	Truck Driver	Skilled	55.20	69.60
	7	Flunkies	Unskilled	39.60	48.00
	27	Crew Leaders	Inter.	45.00	55.20
	55	Crew Men	Unskilled	39.60	48.00

Wage rates shown for security wage workers are those paid after adjustments had been made after June 30 to conform with regulations accompanying new allotments of emergency funds made at the beginning of the new fiscal year, and also to standardize rates in Bureau camps with those in Forest Service camps. Subsistence deductions were also changed during the season for similar reasons. After final adjustments had been made, subsistence deductions for security wage workers in all camps in both California and Oregon were made at the rate of $0.48 per day. Subsistence deductions for all appointees were made on the basis of actual cost and remained at $0.75 per day throughout the season. The board deficit of security wage workers was absorbed by the salary and wage budget of the project. In addition to meals and lodging, subsistence deductions of security wage workers covered emergency medical and dental service for cases not compensable under the U. S. Employees' Compensation Act.

The adjustments in wage rates and subsistence deductions decreased the net earnings of workers in Bureau camps, and when they first went into effect the result was the loss of over two hundred men. Unfortunately, these losses were in the better class of men.

Security wage workers in both California and Oregon worked 120 hours per month. All security wage workers were assigned to the Ribes eradication project by the Works Progress Administration and, as was the case in the two previous years, there was a pronounced shortage of laborers throughout the season.

All laborers for the California operations were unattached men secured largely from the urban communities of the state, such as San Francisco, Oakland, Sacramento, Stockton, Fresno, and Los Angeles. On the Rogue River Operation in Oregon most of the laborers were family men from Medford, Ashland, Grants Pass, and Roseburg.

Plans of camp construction and sanitary regulations were based upon recommendations made by the U. S. Public Health Service as approved by the Division of Plant Disease Control during 1936. In addition to fly-proof kitchen, mess, food storage house, refuse pits and latrines, and piped hot and cold water to kitchen and showers, each camp had a screened and floored hospital tent with first aid man in attendance. Medical and dental cases that could not be handled in camp were taken to a designated doctor in the nearest town.

LOCATION AND DESCRIPTION OF AREAS

The following descriptions of control units locate and describe the areas worked during 1937 and supplement their respective maps. The maps also show the present status of Ribes eradication on each control area. For areas that have been the scene of Ribes eradication activities in the past, more complete descriptions of Ribes growth, timber stands, and general working conditions may be found in previous annual reports.

Oregon

Siskiyou Experimental Plot

On the Siskiyou National Forest, Ribes were removed from the Ribes-to-pine spread plot, established by the Portland Office of Forest Pathology. This plot, consisting of 250 acres of good sugar pine reproduction, covers parts of Sections 13, 14, 23, and 24, T. 37 S., R. 8 W. Working conditions and Ribes distribution were similar to those on areas of few Ribes on the Rogue River National Forest.

Crater Lake National Park

This project was confined to a 1,145 acre tract surrounding Cloud Cap along the east side of Crater Lake; the tract supports an open stand of white bark pine and mountain hemlock. A narrow belt along the rim of the crater contained exceptionally dense mats of *Ribes erythrocarpum* which were very difficult to eradicate because of the trailing habit of this species and its entangled growth with small conifers. Away from the rim of the crater, a scattering growth of *R. cereum* was found. There were from ten to twenty CCC enrollees employed on this job, working out of Camp Wineglass.

Rogue River Operation

The work on the Rogue River National Forest was confined to the Rogue River basin where control work had been done previously. Most of the season was spent on reeradication. On areas reworked, an extremely light Ribes population in all upland types and in parts of the stream type indicated a marked decline in the Ribes population

compared with that of the initial working three years ago.

A small portion of the acreage worked has been logged and about 49 per cent of the area is Federally owned.

California

Plumas Operation

During 1937 two camps were operated by the Forest Service in the northern end of the Plumas National Forest on areas where eradication work had been done previously. The Butt Lake camp finished the area south of Lake Almanor between the North Fork of the Feather River and Butt Lake. This area supported mature timber with little undergrowth and light to medium Ribes concentrations.

The Humbug CCC camp continued work started by ERA crews in 1936. With the exception of the mechanical eradication work on 25 acres of willow and *Ribes inerme* type on Miller Creek the work was in mature timber where Ribes varied in abundance from medium to heavy. The brush was a little more dense and in general the topography steeper than that for the Butt Lake camp area.

About 53 per cent of the area worked is owned by the Federal Government; the greater part of the remainder is owned by the Pacific Gas and Electric Company; Curtis, Collins and Holbrook Company; and the Red River Lumber Company.

Eldorado Operation

In the southern end of the Eldorado National Forest the Bureau and the Forest Service operated one camp each in the Mokelumne River basin. In the Cosumnes basin the Forest Service operated a CCC camp on blister rust control work. About twenty per cent of the area worked this year had been cut over several years ago. Both brush and Ribes varied from medium to heavy in the cutover areas and somewhat lighter in the uncut portion.

Two Bureau camps were conducted in the northern end of the forest: one camp continued the work begun in the Georgetown Divide area in 1936, and the other camp continued operations in the Silver Creek basin. The timber from about one half of this area had been cut approximately thirty years ago. Brush and Ribes conditions were similar to those encountered by the camps in the southern end of the forest.

About 55 per cent of the acreage covered in 1937 is owned by the Federal Government, and the greater part of the remainder by the Michigan-California Lumber Company, the California Door Company, and the Amador Timber Company. Most of the unlogged areas support good sugar pine timber, and the cutover lands have fair to good sugar pine reproduction.

Stanislaus Operation

In the central part of the Stanislaus National Forest the Bureau and the Forest Service each conducted one camp. The Woods Ridge camp, operated by the Forest Service, worked in mature timber at the extreme edge of the control unit. Ribes and brush were light. The Thompson Meadows camp, operated by the Bureau, continued initial eradication started in 1935 and in addition performed second eradication on one section worked initially in 1935. The area is cutover and contains a dense growth of both Ribes and brush. It also supports the best stand of sapling and pole sugar pine in the forest. Topography is steep and rough, and this in combination with numerous Ribes and dense brush, made this a very difficult area to work.

Two Bureau camps operated in the northern end of the forest. One in the Mokelumne River basin continued work on an area begun in 1934, but its main program was the second eradication of Ribes from a part of the area worked in 1934. This district supports excellent mature sugar pine, as well as good stands of advance reproduction; the Ribes were generally sparse. The other camp, located on Cow Creek, was engaged on second, third, and fourth eradication on a cutover area that was previously worked in 1926 and 1933. This area supports fair sugar pine reproduction. The Ribes population, composed largely of seedlings germinating since the last eradication, was generally light, although in certain favorable sites where the original population was particularly dense, large numbers of new bushes were found.

About 67 per cent of the area worked in 1937 is owned by the Federal Government and the rest is mostly owned by the Ruggles Estate and the West Side Lumber Company.

Sierra Operation

Three Forest Service camps and one Bureau camp were established on the northern end of the Sierra National Forest. The Forest Service camps were located on Chowchilla Mountain and the Bureau camp on Miami Creek. Most of the area was logged from ten to fifty years ago and now supports a good stand of sugar pine reproduction. Concentrations of Ribes growing intermingled with dense brush on steep slopes resulted in difficult working conditions. Eighty-nine per cent of the area worked in 1937 is owned by the Federal Government.

METHODS OF WORK

Oregon

Following procedure initiated during 1936, an advance check was made on all areas before any Ribes eradication was started. This method again proved a very valuable aid toward systematic and efficient work.

Standard hand eradication methods were used through the season on both initial and reeradication work. Standard crews and formations were also used with one exception. The exception was the use of a crew varying in size from ten to twenty men, who, because of their age or physical defects, could not work under ordinary conditions. Such crews

were placed on level areas supporting dense concentrations of Ribes cereum, and were able to perform fairly effective work despite their disabilities.

As an experiment in destroying R. bracteosum and R. binominatum growing in stream type, a five acre plot was treated with 315 gallons of Atlacide in aqueous solution. In preparing the solution one and one-half pounds of Atlacide were dissolved in one gallon of water. Seventeen 8-hour man days were expended in treating the area using standard methods of applying the spray with back pumps.

California

In general, methods followed in 1937 were similar to those developed in previous years. The principal variations made were due to the low quality of relief labor. The lack of sufficient qualified supervision to assist the camp superintendent made it particularly difficult to manage the large numbers of unskilled workers. In order to utilize the available supervision to fullest advantage, eradication crews were concentrated in as small an area as possible, even at the expense of a certain amount of lost motion in too frequent movement of crews. As a further aid in bridging the gap of deficient supervision and to restrict the work of the men to the place where it was most effective, the maximum amount of work was confined to areas of numerous Ribes. In fact, the relative abundance of Ribes was an important consideration in the location of some of the camps. However, because of the need for re-eradication it was not possible to rigidly adhere to this policy, and in areas where Ribes were more or less scattered costs were out of all proportion to the number of Ribes removed.

In so far as possible the standard three-man crew was used. However, because of a frequent shortage in men qualified as crew leaders, it was often necessary to increase the size of the crew. Larger crews were general in CCC camps since it was not possible under this program to grant salary increases to men selected as crew leaders and few men wanted the added responsibility without extra pay.

An innovation in Ribes eradication methods in California during 1937 was the construction of a bulldozer unit, patterned after the equipment developed in the Inland Empire for the destruction of Ribes by mechanical means. Mr. Frank Breakey of the methods development project in the Inland Empire spent two weeks in California assisting in the development of the work. The work was done from the Humbug CCC camp on the Plumas National Forest. The special Ribes rake that replaces the regular bulldozer blade was attached to a Cletrac No. 55 tractor.

Work was started along Miller Creek in T. 26 N., R. 7 E. This stream, which is about two miles in length, meanders through flats and meadows for the last mile before flowing into Yellow Creek. Several smaller streams flow into Miller Creek, and several swamps and large springs lie adjacent to its course. The meadows and flats vary in width from one chain at the upper end to about twelve chains at the lower end where severe erosion has occurred leaving the stream in places from eight to ten feet below the general level of the meadow. Dense willow and alder brush was present along both banks of the stream and formed large patches in the adjacent meadows and flats. Since R. inerme occurs

W-232[illegible] - TRACTOR EQUIPPED WITH SPECIAL RIBES RAKE FOR DESTROYING CONCENTRATIONS OF R. INERME AND WILLOW ALONG STREAM BOTTOMS.

W-2207 - DENSE GROWTH OF RIBES INERME MIXED WITH WILLOW IN STREAM BOTTOM; THIS TYPE, KNOWN AS WILLOW-R. INERME SLASH, REQUIRES MECHANICAL METHODS OF ERADICATION.

in profusion entwined with the other brush species it was necessary to remove all brush in order to do a thorough job of Ribes eradication.

Since this was the first time eradication of Ribes by mechanical methods has been used in California it was necessary to start with an inexperienced crew consisting of a tractor driver, a ground pilot, and a ground crew composed of from four to six men. The tractor driver had charge of both the operation and the servicing of the machine. The ground pilot assisted the tractor driver in surveying the area and guided the machine through the brush when necessary. He also supervised the work of the ground crew whose duties were to trim brush piles, pull all missed Ribes bushes, cut out missed brush roots, and set chokers for the tractor when necessary.

Work started near the mouth of Miller Creek and progressed up stream. After the driver and ground pilot had looked over each large patch of brush and decided on the best method of work, the driver would move the tractor in with the rake, systematically uprooting the ground cover and piling it into windrows or piles. The rake was set to take into the piles the leaf mold and duff but as little dirt as possible. By the regular bulldozer method it was impossible to work the high, steeply eroded banks along the creek, or the three small swamps, so the brush was pulled from these places by the use of a choker attached to the tractor. This method was slower than plain bulldozing but much faster than eradicating the Ribes by hand.

The bulldozer did a clean job of brush removal, and very few Ribes or brush roots were left. After the first two weeks, when the driver and crew were learning their respective duties, progress was quite rapid except along the steep banks and in the swampy places.

After the first fall rains an attempt was made to burn the brush pile, but owing to the recent piling and the large amount of precipitation, the brush on only about one half the area would burn. Following burning the piles of ashes were broken down and scattered by the bulldozer and the area was then seeded.

RESULTS

Accomplishments under the ERA program of 1937, measured in output per total man day of employment, were low, in fact, the lowest of all years of blister rust control operations in the Sugar Pine Region. The principal reasons for this low productivity are:

1. Quality of labor. There has been a steady decline in the quality of labor assigned to blister rust control work since the inception of the emergency relief program, and by the end of 1937 it had reached the all time low.

2. Labor turnover. Closely associated with the quality of the labor was the high rate of turnover, due largely to (a) physical unfitness of men assigned to Ribes eradication work, (b) assignment of a high percentage of unemployables that, although physically sound, were constitutionally indisposed to work of any type, (c) predilection of many men to alcholic drink, (d) dissatisfaction

with camp work in the mountains, due chiefly to the fact that most assignments were from urban centers where maximum security wage rates are paid, and to a general tendency on the part of city labor to dislike mountain work and living conditions.

3. Restrictions of operation under the emergency program. Because of the limitations in other than wage expenditures and in the employment of persons at other than security wages or from other than relief rolls (95 to 5 ratio), it was necessary to operate camps of 100 men or more. Camps of this size, although less expensive to operate than smaller camps, are, under average conditions of Ribes distribution, less efficient from the standpoint of accomplishments in Ribes eradication work. As a general rule the more scattered the Ribes the greater the loss in working efficiency. The principal reasons for this lowering of unit productiveness in large camps are the inflexibility of such large units, the reduction of personal contact between camp superintendent and his subordinates, and the difficulty of adequately supervising crew work in areas of light Ribes, a problem of particular acuteness in reeradication and areas naturally light in Ribes. In order to meet the 95 to 5 employment restrictions it was necessary to obtain all assistant camp superintendents from the ranks of security wage workers, and in most cases properly qualified men for these positions were not available from this labor source or at this rate of pay.

On two of the four California operations, reeradication formed a large part of the control program. However, only areas on which reeradication could no longer be delayed without endangering the permanent Ribes suppression objective were so treated, due to the general inefficiency of relief labor on reeradication work.

In Oregon this year's work marked the beginning of the first extensive reeradication program. It was interesting to note that Ribes seedlings apparently present a small problem, whereas sprouts from crown or stem tissue left in or on the soil during the initial working proved to be the major cause of the need for reeradication. Sprouting was particularly pronounced on an area in the Foster Creek basin which was covered, initially, late in the season of 1935. Poor labor and the lateness of the season were factors contributing to this condition.

Compared with the original population a marked decline in the number of Ribes was evident in all areas reworked. In the upland types, this condition speeded eradication work, thereby reducing costs. However, in stream type in the Upper Rogue basin, the dense, entangled growth of associated brush and other plants made Ribes searching time nearly as great as that for initial eradication. No special decrease in the cost of stream type eradication was noted. On a few stream branches that were free from brush growth and chiefly in open country, it seems quite possible that a maintenance condition has been reached.

On the Prospect area, an extremely light Ribes population was found in all upland types and in some stream types. The greatest part of the upland reeradication work was directly due to inadequate coverage on the two per cent advance check in 1934. This year five per cent of the areas were covered on the post check, and, as a result, numerous isolated spots of Ribes growth were found in areas which had blocked out as Ribes free on the previous two per cent advance check. After this second working most of the upland type is probably in a maintenance condition. The swampy, brushy, streams, which contained numerous Ribes, will no doubt need two or more additional treatments before maintenance is attained.

In order to simplify the tabulation of results, the data for all operations, both in California and Oregon, are given in the same table for each type of summary. Summaries of data for the Region appear in the following described tables, charts, and maps.

A map of each of the five operations depicts in color the progress of control work.

Table No. 1 - The acreage of blister rust control units and the status of Ribes eradication by land ownership in the Sugar Pine Region as of December 31, 1937.

Table No. 2 - The distribution of camps by operation and county for the Sugar Pine Region during the 1937 season.

Table No. 3 - Summary of Ribes eradication by operations for the Sugar Pine Region - 1937.

Table No. 4 - Summary of employment financed by ERA funds (WPA) from January 1 to December 31, 1937. This table illustrates to a certain extent the large labor turnover which occurred during the working season. However, it does not tell the complete story, as all camps were far below standard strength when the season ended, and had been undermanned for a considerable part of the season.

Table No. 5 - Adjusted statement of cost for the Sugar Pine Region Ribes eradication projects - 1937. This is a summary of the itemized expenditures of each operation for both Bureau and Forest Service funds adjusted to show the actual cost of the field operations.

Table No. 6 - Meal costs for the Ribes eradication projects of the Sugar Pine Region - 1937.

Chart No. 1 - The status of blister rust control in California, December 31, 1937.

Chart No. 2 - Status of blister rust control in Oregon, December 1937.

Chart No. 3 - Progress of initial Ribes eradication by land ownership classes, California, December 1937.

Chart No. 4 - Progress of initial Ribes eradication by land ownership classes, Oregon, December 1937.

Chart No. 5 - Ribes eradication production chart for California, 1934-1937.

Chart No. 6 - Reduction in Ribes population through successive eradications. This chart illustrates the general progress in permanent suppression of Ribes in California resulting from successive eradications. The data for the several classes of eradications are averages for all areas worked and are therefore only broadly indicative of the general trend. Data from successive workings of the same area would be more significant but are as yet unavailable.

The average cost of an effective 6-hour man day on Ribes eradication for each operation is as follows:

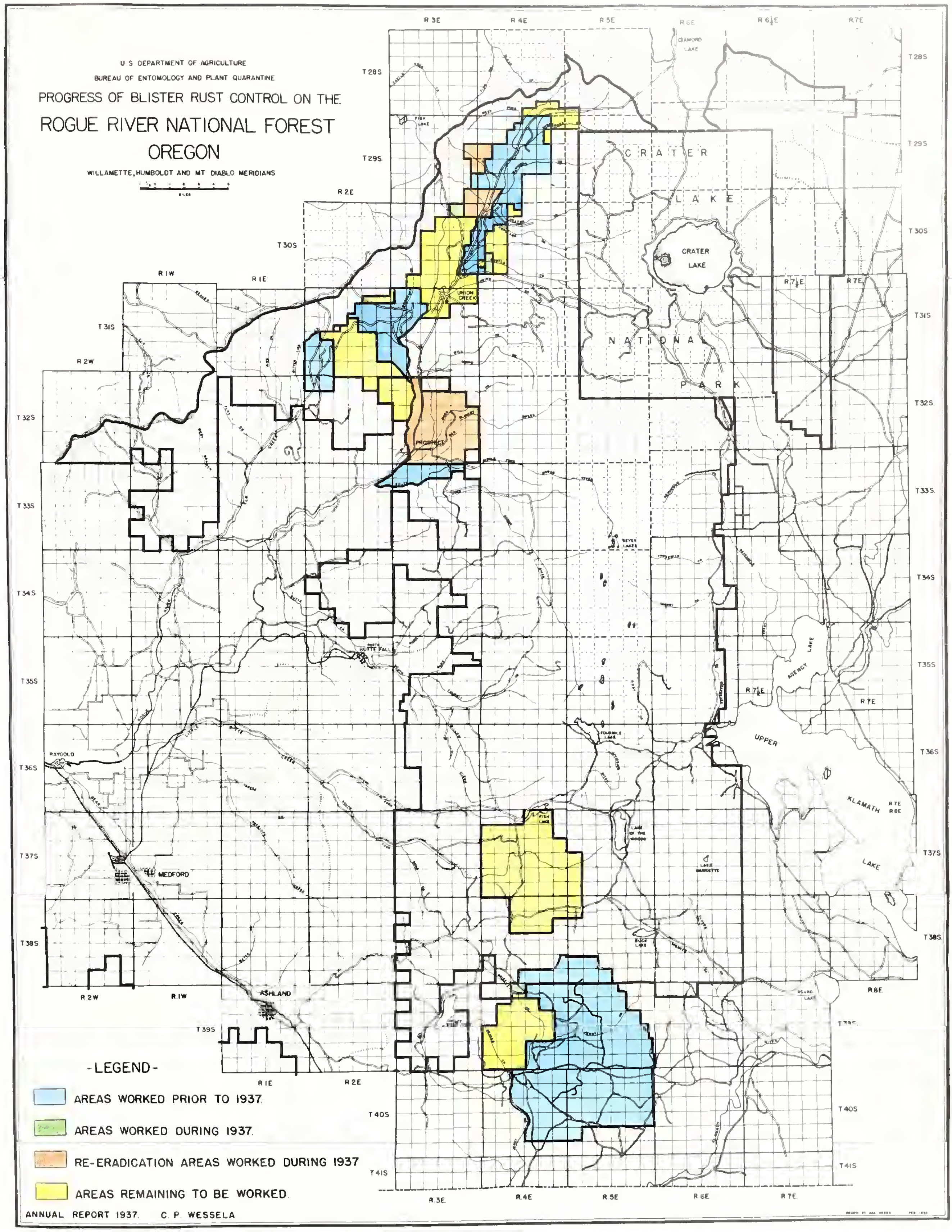
Rogue River, Oregon - - - - - - - - - -	$9.21
Plumas, California - - - - - - - - - -	7.72
Eldorado, " - - - - - - - - - -	5.25
Stanislaus, " - - - - - - - - - -	4.84
Sierra, " - - - - - - - - - -	5.02

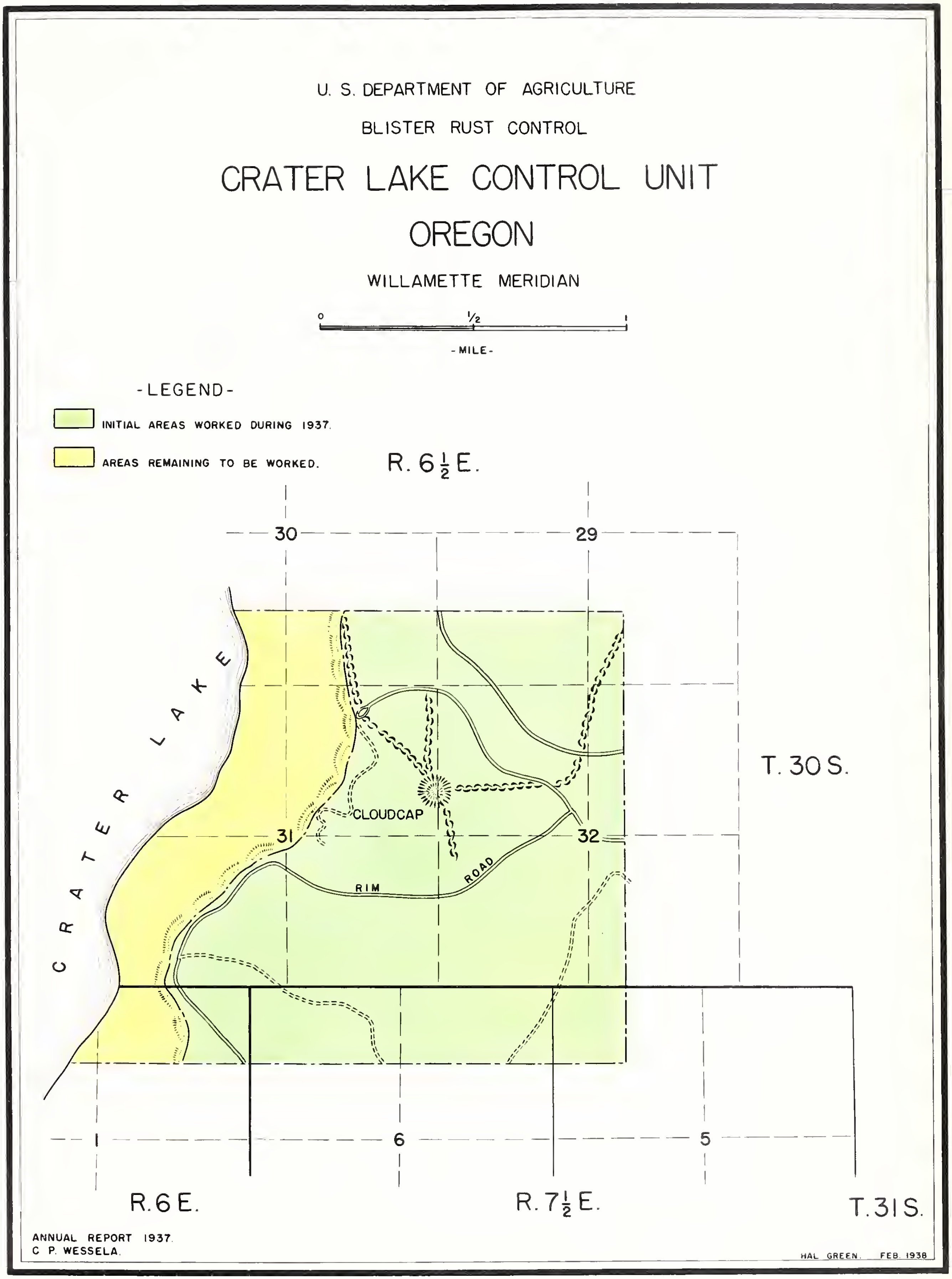
The effective man day cost for Oregon is high for two reasons; (1) a higher security wage was paid in Oregon than in California, and (2) the Oregon operation consisted of but one camp which had to absorb all overhead charges. The high cost for the Plumas operation is due to the fact that it only had one ERA camp and one CCC camp over which to prorate the overhead expense.

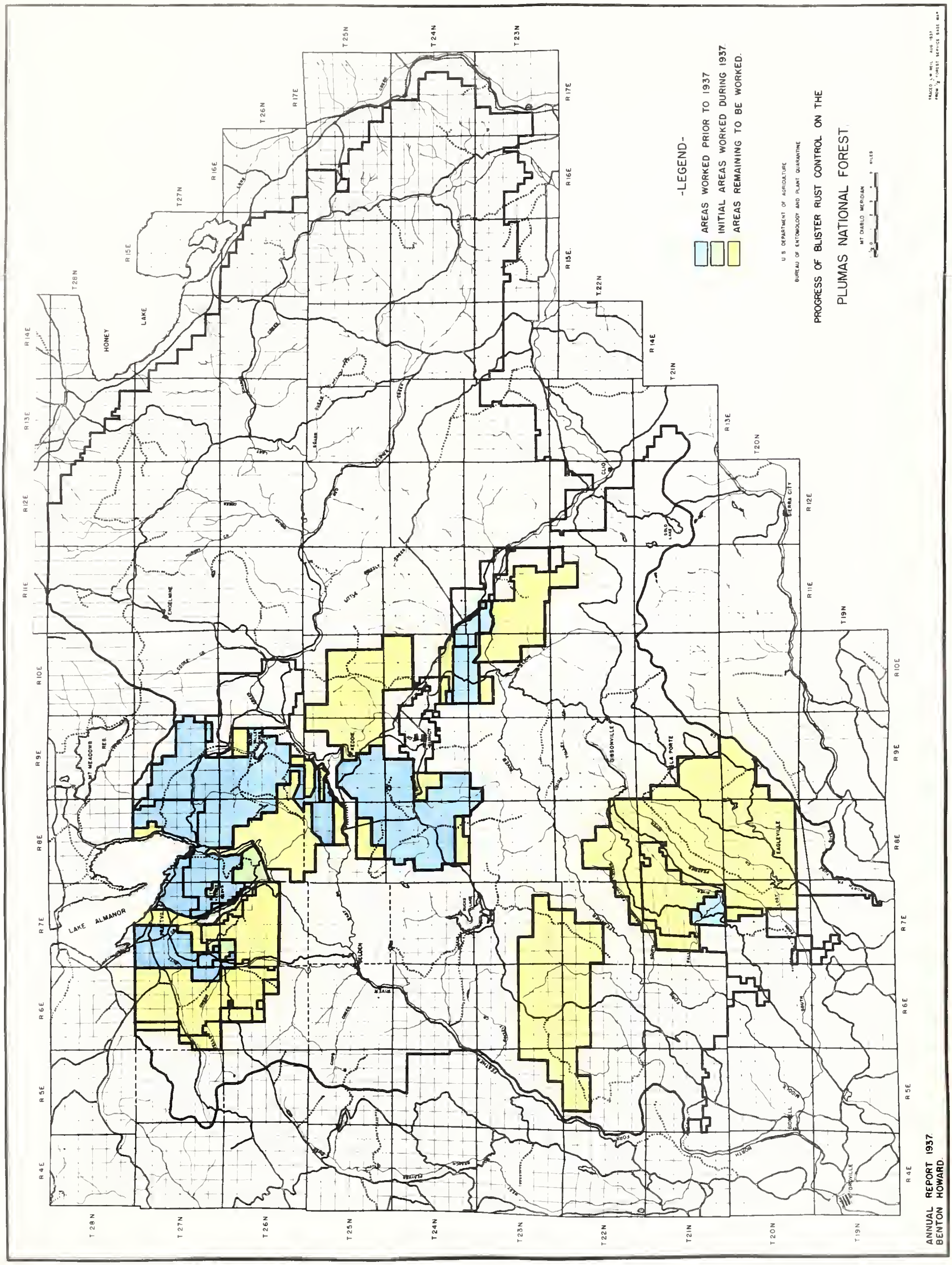
Effective man days represent the time of the men in camp (string men, crew men, and crew leaders only) that is directly spent on the actual job of Ribes eradication. The cost of an effective man day is derived by dividing the total adjusted cost of an operation (see Table No. 5) by the number of effective man days.

W-1962 - THREE-MAN HAND ERADICATION CREW WORKING IN MATURE TIMBER TYPE. STRING IS USED TO DEFINE WORK STRIPS.

W-1424 - BRUSH SLASHING OF CEANOTHUS SPP. RIBES GROWING IN CLOSE ASSOCIATION AVERAGING ABOUT 8,000 BUSHES PER ACRE.


U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
ROGUE RIVER NATIONAL FOREST
OREGON
WILLAMETTE, HUMBOLDT AND MT DIABLO MERIDIANS
CRATER LAKE NATIONAL PARK
CRATER LAKE
UNION CREEK
PROSPECT
BUTTE FALLS
MEDFORD
ASHLAND
UPPER KLAMATH LAKE
AGENCY LAKE
FISH LAKE
FOURMILE LAKE
LAKE OF THE WOODS
BUCK LAKE
-LEGEND-
AREAS WORKED PRIOR TO 1937.
AREAS WORKED DURING 1937.
RE-ERADICATION AREAS WORKED DURING 1937
AREAS REMAINING TO BE WORKED.
ANNUAL REPORT 1937. C. P. WESSELA


U. S. DEPARTMENT OF AGRICULTURE
BLISTER RUST CONTROL
CRATER LAKE CONTROL UNIT
OREGON
WILLAMETTE MERIDIAN
0
½
-MILE-
-LEGEND-
INITIAL AREAS WORKED DURING 1937.
AREAS REMAINING TO BE WORKED.
R. 6½ E.
30
29
CRATER LAKE
CLOUDCAP
31
32
RIM ROAD
T. 30 S.
6
5
R. 6 E.
R. 7½ E.
T. 31 S.
ANNUAL REPORT 1937.
C. P. WESSELA.
HAL GREEN. FEB. 1938


-LEGEND-
AREAS WORKED PRIOR TO 1937
INITIAL AREAS WORKED DURING 1937
AREAS REMAINING TO BE WORKED.
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
PLUMAS NATIONAL FOREST
MT DIABLO MERIDIAN
ANNUAL REPORT 1937
BENTON HOWARD
LAKE ALMANOR
HONEY
LAKE
CLIO
SIERRA CITY
LA PORTE
GIBSONVILLE
OROVILLE
T 28 N
T 27 N
T 26 N
T 25 N
T 24 N
T 23 N
T 22 N
T 21 N
T 20 N
T 19 N
R 4 E
R 5 E
R 6 E
R 7 E
R 8 E
R 9 E
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R 13 E
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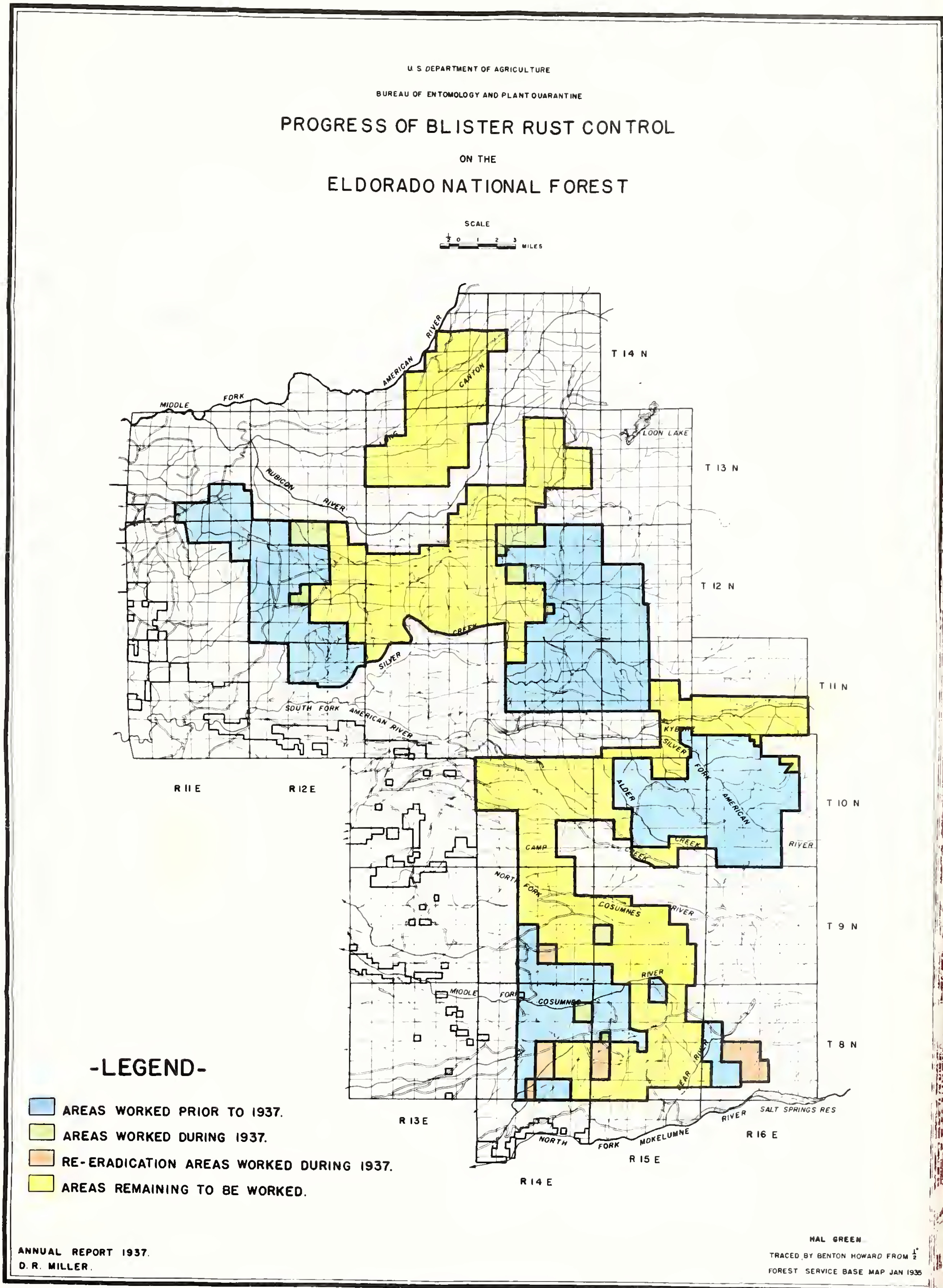
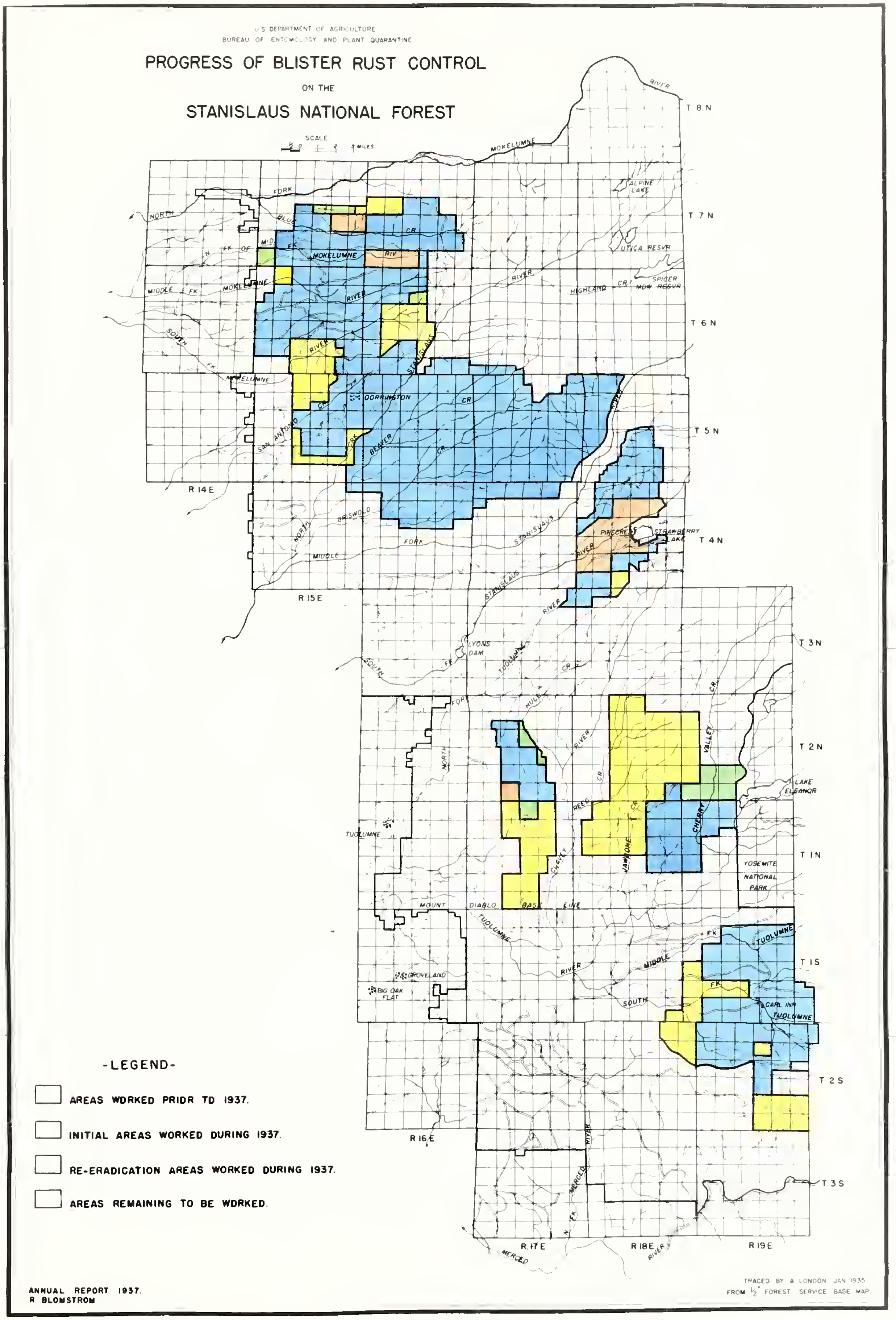
R 15 E
R 16 E
R 17 E

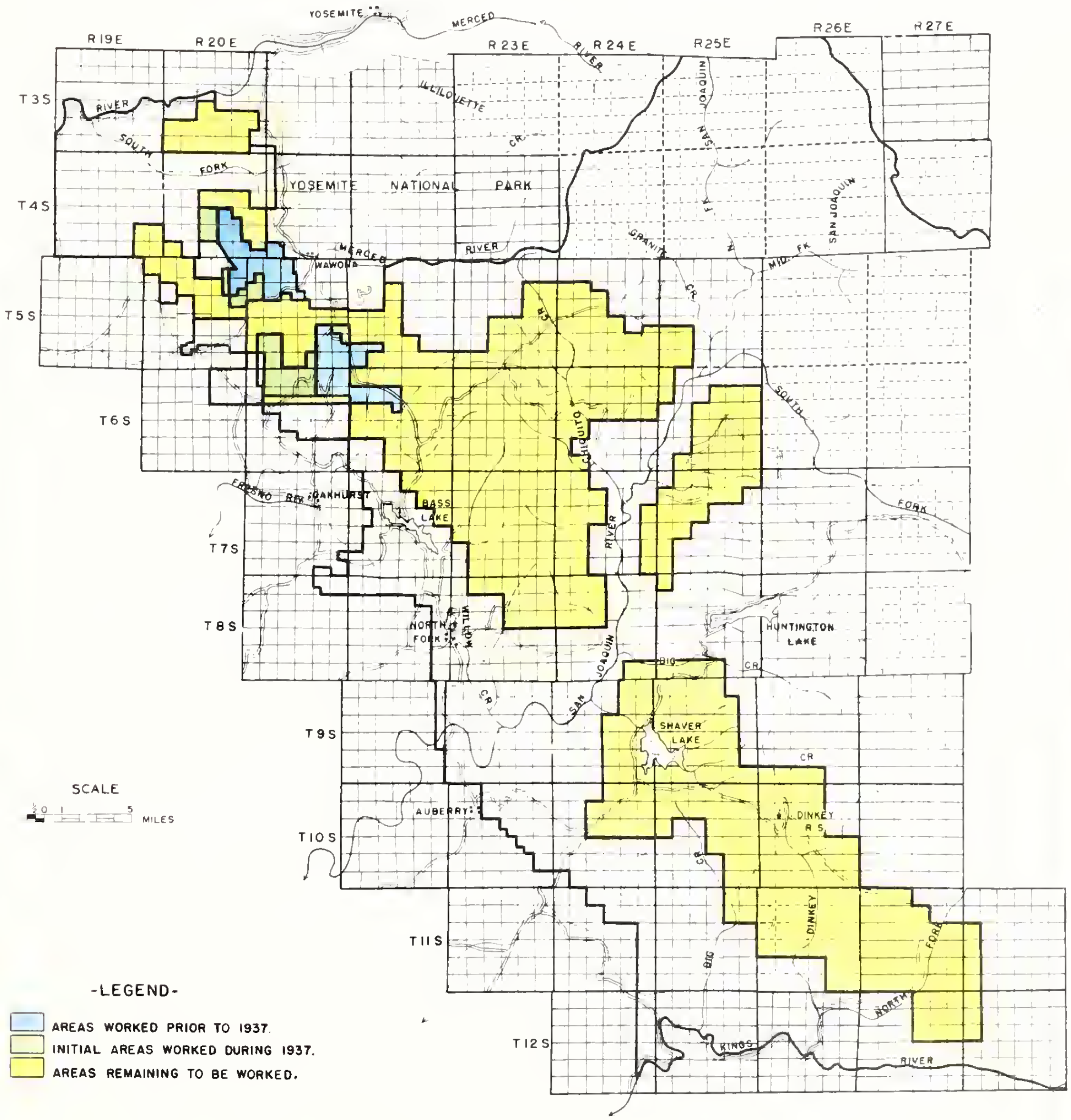

U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL
ON THE
ELDORADO NATIONAL FOREST
SCALE
MILES
T 14 N
T 13 N
T 12 N
T 11 N
T 10 N
T 9 N
T 8 N
R 11 E
R 12 E
R 13 E
R 14 E
R 15 E
R 16 E
MIDDLE FORK AMERICAN RIVER
CANYON
LOON LAKE
RUBICON RIVER
SILVER CREEK
SOUTH FORK AMERICAN RIVER
KYE
SILVER FORK AMERICAN RIVER
ALDER CREEK
CAMP CREEK
NORTH FORK COSUMNES RIVER
MIDDLE FORK COSUMNES RIVER
BEAR RIVER
SALT SPRINGS RES
NORTH FORK MOKELUMNE RIVER
-LEGEND-
AREAS WORKED PRIOR TO 1937.
AREAS WORKED DURING 1937.
RE-ERADICATION AREAS WORKED DURING 1937.
AREAS REMAINING TO BE WORKED.
ANNUAL REPORT 1937.
D. R. MILLER.
HAL GREEN
TRACED BY BENTON HOWARD FROM 1/2"
FOREST SERVICE BASE MAP JAN 1935


U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL
ON THE
STANISLAUS NATIONAL FOREST
SCALE
T 8 N
T 7 N
T 6 N
T 5 N
T 4 N
T 3 N
T 2 N
T 1 N
T 1 S
T 2 S
T 3 S
R 14 E
R 15 E
R 16 E
R 17 E
R 18 E
R 19 E
MOKELUMNE
ALPINE LAKE
UTICA RESVR
SPICER MDW RESVR
HIGHLAND CR
DORRINGTON
STRAWBERRY LAKE
PINECREST
LYONS DAM
LAKE ELEANOR
YOSEMITE NATIONAL PARK
TUOLUMNE
MOUNT DIABLO BASE LINE
GROVELAND
BIG OAK FLAT
CARL INN
-LEGEND-
AREAS WORKED PRIOR TO 1937.
INITIAL AREAS WORKED DURING 1937.
RE-ERADICATION AREAS WORKED DURING 1937.
AREAS REMAINING TO BE WORKED.
ANNUAL REPORT 1937.
R. BLOMSTROM
TRACED BY A. LONDON JAN. 1935
FROM ½" FOREST SERVICE BASE MAP

U S DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

PROGRESS OF BLISTER RUST CONTROL ON THE SIERRA NATIONAL FOREST



ANNUAL REPORT 1937.
F.A PATTY.

TRACED BY C FOWLER APRIL 1935
FROM ¼ FOREST SERVICE BASE MAP

TABLE NO. 1

THE ACREAGE OF BLISTER RUST CONTROL UNITS AND THE STATUS OF RIBES ERADICATION BY LAND OWNERSHIP IN THE SUGAR PINE REGION AS OF DECEMBER 31, 1937

PART A - CALIFORNIA

Control Unit	Class of Ownership	Acreage of Control Units: White and Sugar Pine Type	Non-White and -Sugar Pine Type	Total Acreage	Acreage Unworked	Status of Eradication: First Working: Acres	Man Days	Ribes	Second Working: Acres	Man Days	Ribes	Third Working: Acres	Man Days	Ribes	Fourth Working: Acres	Man Days	Ribes	Totals of All Workings: Acreage First Working	Acreage Second Working	Acreage Third Working	Acreage Fourth Working	Man Days	Ribes Eradicated
NATIONAL FORESTS																							
Mendocino National Forest	Federal	16,290	4,727	21,017	21,017																		
	Private	12,067	3,112	15,179	15,179																		
	State	40	8	48	48																		
	Total	28,397	7,847	36,244	36,244																		
Trinity National Forest	Federal	107,288	15,287	122,575	122,575																		
	Private	37,214	3,069	40,283	40,283																		
	State	2,035	53	2,088	2,088																		
	Total	146,537	18,409	164,946	164,946																		
Klamath National Forest	Federal	24,690	6,615	31,305	31,305																		
	Private	27,555	10,980	38,535	38,535																		
	Total	52,245	17,595	69,840	69,840																		
Shasta National Forest	Federal	2,615	996	3,611	3,611																		
	Private	60,970	13,181	74,151	74,151																		
	Total	63,585	14,177	77,762	77,762																		
Lassen National Forest	Federal	35,634	19,220	54,854	50,974	3,880	318	56,984										3,880				318	56,984
	Private	205,080	40,341	245,421	230,721	14,700	1,823	388,690										14,700				1,823	388,690
	State	480	160	640	640	-	-	-										-				-	-
	Total	241,194	59,721	300,915	282,335	18,580	2,141	445,674										18,580				2,141	445,674
Plumas National Forest	Federal	150,458	43,211	193,669	137,465	56,204	28,534	6,402,290	4,947	2,032	160,069							56,204	4,947			30,566	6,562,359
	Private	140,459	28,193	168,652	112,203	56,449	29,073	6,927,637	1,263	717	92,064							56,449	1,263			29,790	7,019,701
	State	-	322	322	282	40	21	4,620	-	-	-							40	-			21	4,620
	Total	290,917	71,726	362,643	249,950	112,693	57,628	13,334,547	6,210	2,749	252,133							112,693	6,210			60,377	13,586,680
Tahoe National Forest	Federal	16,325	3,600	19,925	19,925																		
	Private	18,063	1,920	19,983	19,983																		
	Total	34,388	5,520	39,908	39,908																		
Eldorado National Forest	Federal	86,584	40,040	126,624	70,462	56,162	22,863	7,339,468	3,242	2,631	166,300							56,162	3,242			25,494	7,505,768
	Private	110,837	21,398	132,235	66,127	66,108	31,142	9,976,277	2,336	2,103	179,873							66,108	2,336			33,245	10,156,150
	State	2,322	320	2,642	40	2,602	1,634	310,891	-	-	-							2,602	-			1,634	310,891
	Total	199,743	61,758	261,501	136,629	124,872	55,639	17,626,636	5,578	4,734	346,173							124,872	5,578			60,373	17,972,809
*Stanislaus National Forest	Federal	72,803	30,025	102,828	29,749	73,079	28,413	6,938,606	18,651	7,976	2,648,333	4,815	1,928	162,144	3,971	1,362	89,314	73,079	18,651	4,815	3,971	39,679	9,838,397
	Private	123,042	16,728	139,770	32,534	107,236	46,800	16,481,681	10,433	1,909	743,265	960	184	18,453	347	47	1,998	107,236	10,433	960	347	48,940	17,245,397
	State	320	87	407	-	407	129	16,768	-	-	-	-	-	-	-	-	-	407	-	-	-	129	16,768
	Total	196,165	46,840	*243,005	62,283	180,722	75,342	23,437,055	29,084	9,885	3,391,598	5,775	2,112	180,597	4,318	1,409	91,312	180,722	29,084	5,775	4,318	88,748	27,100,562
Sierra National Forest	Federal	144,163	134,267	278,430	256,545	21,885	41,902	8,471,883										21,885				41,902	8,471,883
	Private	47,980	18,670	66,650	64,520	2,130	3,902	732,988										2,130				3,902	732,988
	State	10	150	160	160	-	-	-										-				-	-
	Total	192,153	153,087	345,240	321,225	24,015	45,804	9,204,871										24,015				45,804	9,204,871
Sequoia National Forest	Federal	19,475	24,455	43,930	43,930																		
	Private	9,120	9,760	18,880	18,880																		
	Total	28,595	34,215	62,810	62,810																		
Total All National Forests	Federal	676,325	322,443	998,768	787,558	211,210	122,030	29,209,231	26,840	12,639	2,974,702	4,815	1,928	162,144	3,971	1,362	89,314	211,210	26,840	4,815	3,971	137,959	32,435,391
	Private	792,387	167,352	959,739	713,116	246,623	112,740	34,507,273	14,032	4,729	1,015,202	960	184	18,453	347	47	1,998	246,623	14,032	960	347	117,700	35,542,926
	State	5,207	1,100	6,307	3,258	3,049	1,784	332,279	-	-	-	-	-	-	-	-	-	3,049	-	-	-	1,784	332,279
	Total	1,473,919	490,895	1,964,814	1,503,932	460,882	236,554	64,048,783	40,872	17,368	3,989,904	5,775	2,112	180,597	4,318	1,409	91,312	460,882	40,872	5,775	4,318	257,443	68,310,596
NATIONAL PARKS																							
Lassen Volcanic National Park	Federal	2,200	9,460	11,660	11,660																		
Yosemite National Park	Federal	77,236	43,384	120,620	118,417	2,203	2,699	531,801										2,203				2,699	531,801
	Private	500	2,010	2,510	2,510	-	-	-										-				-	-
	Total	77,736	45,394	123,130	120,927	2,203	2,699	531,801										2,203				2,699	531,801
General Grant National Park	Federal	2,560	-	2,560	2,560																		
Sequoia National Park	Federal	40,315	30,965	71,280	71,280																		
Total All National Parks	Federal	122,311	83,809	206,120	203,917	2,203	2,699	531,801										2,203				2,699	531,801
	Private	500	2,010	2,510	2,510	-	-	-										-				-	-
	Total	122,811	85,819	208,630	206,427	2,203	2,699	531,801										2,203				2,699	531,801
STATE PARKS																							
Latour State Park	Private	1,920	80	2,000	2,000																		
	State	4,146	4,979	9,125	9,125																		
	Total	6,066	5,059	11,125	11,125																		
Calaveras Big Trees State Park	Private	120	-	120	-	120	21	3,260	-	-	-							120	-			21	3,260
	State	1,618	355	1,973	225	1,748	1,318	185,001	215	26	4,792							1,748	215			1,344	189,793
	Total	1,738	355	2,093	225	1,868	1,339	188,261	215	26	4,792							1,868	215			1,365	193,053
Total All State Parks	Private	2,040	80	2,120	2,000	120	21	3,260	-	-	-							120	-			21	3,260
	State	5,764	5,334	11,098	9,350	1,748	1,318	185,001	215	26	4,792							1,748	215			1,344	189,793
	Total	7,804	5,414	13,218	11,350	1,868	1,339	188,261	215	26	4,792							1,868	215			1,365	193,053
TOTAL																							
Total All Control Units	Federal	798,636	406,252	1,204,888	991,475	213,413	124,729	29,741,032	26,840	12,639	2,974,702	4,815	1,928	162,144	3,971	1,362	89,314	213,413	26,840	4,815	3,971	140,658	32,967,192
	Private	794,927	169,442	964,369	717,626	246,743	112,761	34,510,533	14,032	4,729	1,015,202	960	184	18,453	347	47	1,998	246,743	14,032	960	347	117,721	35,546,186
	State	10,971	6,434	17,405	12,608	4,797	3,102	517,280	215	26	4,792	-	-	-	-	-	-	4,797	215	-	-	3,128	522,072
	Total	1,604,534	582,128	2,186,662	1,721,709	464,953	240,592	64,768,845	41,087	17,394	3,994,696	5,775	2,112	180,597	4,318	1,409	91,312	464,953	41,087	5,775	4,318	261,507	**69,035,450

* Includes 8,206 acres of Private and Federal lands in process of acquisition by Yosemite National Park.

** In addition, it is estimated that 79,200, 51,000, and 25,000 Ribes were destroyed in 1934, 1935 and 1937 respectively by slashing and bulldozer work on the Plumas National Forest.

TABLE NO. 1 (CONTINUED)

THE ACREAGE OF BLISTER RUST CONTROL UNITS AND THE STATUS OF RIBES ERADICATION BY LAND OWNERSHIP IN THE SUGAR PINE REGION AS OF DECEMBER 31, 1937

PART B - OREGON

Control Unit	Class of Ownership	Acreage of Control Units: White and Sugar Pine Type	Non-White and -Sugar Pine Type	Total Acreage	Acreage Unworked	Status of Eradication: First Working: Acres	Man Days	Ribes	Second Working: Acres	Man Days	Ribes	Third Working: Acres	Man Days	Ribes	Fourth Working: Acres	Man Days	Ribes	Totals of All Workings: Acreage First Working	Acreage Second Working	Acreage Third Working	Acreage Fourth Working	Man Days	Ribes Eradicated
NATIONAL FORESTS																							
Rogue River National Forest	Federal – National Forest	75,179	18,794	93,973	55,292	38,681	19,099	9,298,437	15,619	3,252	413,506							38,681	15,619			22,351	9,711,943
	Federal – O and C	11,576	2,894	14,470	9,076	5,394	1,154	196,371	-	-	-							5,394	-			1,154	196,371
	Federal – Total	86,755	21,688	108,443	64,368	44,075	20,253	9,494,808	15,619	3,252	413,506							44,075	15,619			23,505	9,908,314
	Private	64,252	16,063	80,315	11,618	68,697	6,480	1,069,202	10,415	935	67,199							68,697	10,415			7,415	1,136,401
	State	40	-	40	-	40	217	87,560	-	-	-							40	-			217	87,560
	Total	151,047	37,751	188,798	75,986	112,812	26,950	10,651,570	26,034	4,187	480,705							112,812	26,034			31,137	11,132,275
Siskiyou National Forest	Federal – National Forest	60,397	10,658	71,055	70,850	205	7	104										205				7	104
	Federal – O and C	81,495	14,381	95,876	95,831	45	1	-										45				1	-
	Federal – Total	141,892	25,039	166,931	166,681	250	8	104										250				8	104
	Private	59,874	10,565	70,439	70,439	-	-	-										-	-			-	-
	State	689	141	830	830	-	-	-										-	-			-	-
	Total	202,455	35,745	238,200	237,950	250	8	104										250	-			8	104
Umpqua National Forest	Federal – National Forest	50,955	12,738	63,693	63,693																		
	Federal – O and C	2,752	688	3,440	3,440																		
	Federal – Total	53,707	13,426	67,133	67,133																		
	Private	6,582	1,645	8,227	8,227																		
	State	320	-	320	320																		
	Total	60,609	15,071	75,680	75,680																		
Siuslaw National Forest	Federal	140	382	522	-	522	337	119,777	85	66	10,482							522	85			403	130,259
Mt. Hood National Forest	Federal	29,016	7,253	36,269	33,620	2,649	1,651	194,292	1,522	939	242,688	244	398	115,168				2,649	1,522	244		2,988	552,148
Total All National Forests	Federal – National Forest	215,687	49,825	265,512	223,455	42,057	21,094	9,612,610	17,226	4,257	666,676	244	398	115,168				42,057	17,226	244		25,749	10,394,454
	Federal – O and C	95,823	17,963	113,786	108,347	5,439	1,155	196,371	-	-	-	-	-	-				5,439	-	-		1,155	196,371
	Federal – Total	311,510	67,788	379,298	331,802	47,496	22,249	9,808,981	17,226	4,257	666,676	244	398	115,168				47,496	17,226	244		26,904	10,590,825
	Private	130,708	28,273	158,981	90,284	68,697	6,480	1,069,202	10,415	935	67,199	-	-	-				68,697	10,415	-		7,415	1,136,401
	State	1,049	141	1,190	1,150	40	217	87,560	-	-	-	-	-	-				40	-	-		217	87,560
	Total	443,267	96,202	539,469	423,236	116,233	28,946	10,965,743	27,641	5,192	733,875	244	398	115,168				116,233	27,641	244		34,536	11,814,786
NATIONAL PARKS																							
Crater Lake National Park	Federal	1,295	-	1,295	150	1,145	376	119,913										1,145				376	119,913
TOTAL																							
Total All Control Units	Federal – National Forest	215,687	49,825	265,512	223,455	42,057	21,094	9,612,610	17,226	4,257	666,676	244	398	115,168				42,057	17,226	244		25,749	10,394,454
	Federal – O and C	95,823	17,963	113,786	108,347	5,439	1,155	196,371	-	-	-	-	-	-				5,439	-	-		1,155	196,371
	Federal – National Park	1,295	-	1,295	150	1,145	376	119,913	-	-	-	-	-	-				1,145	-	-		376	119,913
	Federal – Total	312,805	67,788	380,593	331,952	48,641	22,625	9,928,894	17,226	4,257	666,676	244	398	115,168				48,641	17,226	244		27,280	10,710,738
	Private	130,708	28,273	158,981	90,284	68,697	6,480	1,069,202	10,415	935	67,199	-	-	-				68,697	10,415	-		7,415	1,136,401
	State	1,049	141	1,190	1,150	40	217	87,560	-	-	-	-	-	-				40	-	-		217	87,560
	Total	444,562	96,202	540,764	423,386	117,378	29,322	11,085,656	27,641	5,192	733,875	244	398	115,168				117,378	27,641	244		34,912	11,934,699
PART C - TOTAL FOR THE REGION																							
California and Oregon	Federal	1,111,441	474,040	1,585,481	1,323,427	262,054	147,354	39,669,926	44,066	16,896	3,641,378	5,059	2,326	277,312	3,971	1,362	89,314	262,054	44,066	5,509	3,971	167,938	43,677,930
	Private	925,635	197,715	1,123,350	807,910	315,440	119,241	35,579,735	24,447	5,664	1,082,401	960	184	18,453	347	47	1,998	315,440	24,447	960	347	125,136	36,682,587
	State	12,020	6,575	18,595	13,758	4,837	3,319	604,840	215	26	4,792	-	-	-	-	-	-	4,837	215	-	-	3,345	609,632
	Total	2,049,096	678,330	2,727,426	2,145,095	582,331	269,914	75,854,501	68,728	22,586	4,728,571	6,019	2,510	295,765	4,318	1,409	91,312	582,331	68,728	6,019	4,318	296,419	80,970,149

TABLE NO. 2

THE DISTRIBUTION OF CAMPS BY OPERATION AND COUNTY FOR THE SUGAR PINE REGION DURING THE 1937 SEASON

National Forest	Agency	County	Number of Camps	Average Size of Camps	Approximate Period of Operation	Location
			CALIFORNIA			
Plumas	FS-ERA	Plumas	1	100	July 25-Oct. 22	Butt Lake
	FS-CCC	"	1	80	July 12-Oct. 1	Humbug Valley
Eldorado	EQ-ERA	Eldorado	2	100	June 15-Oct. 15	Butchers Corral and Little Silver
	EQ-ERA	Amador	1	125	June 4-Oct. 31	Matson Mill
	FS-ERA	"	1	100	July 17-Oct. 18	Bear River
	FS-CCC	Eldorado	1	60	July 10-Oct. 8	Caldor
Stanislaus	EQ-ERA	Tuolumne	1	100	June 1-Oct. 15	Cow Creek
	EQ-ERA	Calaveras	1	100	June 1-Oct. 15	Forest Creek
	EQ-ERA	Tuolumne	1	125	June 1-Nov. 1	Thompson Meadows
	FS-ERA	Tuolumne	1	100	July 22-Oct. 15	Woods Ridge
Sierra	EQ-ERA	Mariposa	1	150	May 1-Nov. 30	Miami Creek
	FS-ERA	Madera	1	100	May 18-July 15	Batterson
	FS-ERA	Mariposa	3	100	July 15-Oct. 15	Summit, Signal Peak, and Bear Wallow
	*EQ-ERA	Fresno	1	55	Jan. 1-Apr. 30	Hutchens
	*EQ-ERA	Mariposa	1	60	Dec. 1-Dec. 31	Bootjack
			OREGON			
Rogue River	EQ-ERA	Jackson	1	30	May 15-June 30	Prospect
	EQ-ERA	"	1	75	May 15-June 30	Union Creek
	EQ-ERA	"	1	100	July 1-Oct. 15	Union Creek
	NP-CCC	Klamath	1	15	July 15-Sept. 15	Wineglass

* These camps were operated during the winter and did not do any actual eradication work.

TABLE NO. 3

SUMMARY OF RIBES ERADICATION BY OPERATIONS FOR THE SUGAR PINE REGION - 1937

PART A - CALIFORNIA OPERATIONS

Agency	Class of Work	Eradication Type	Acres			Man Days			Ribes by Species					Total Ribes Eradicated	Per Acre Basis		Ownership Status								
																	Acres			Man Days			Ribes		
			Worked	Blocked Out	Total	Worked	Blocked Out	Total	Ribes roezli	Ribes nevadense	Ribes cereum	Ribes viscosissimum	Ribes inerme		Man Days	Ribes	Federal	Private	Total	Federal	Private	Total	Federal	Private	Total
PLUMAS NATIONAL FOREST																									
Forest Service -E.R.A.	First Working	Timber	2,303	623	2,926	2,808	-	2,808	215,174	27,861	-	1,433	-	244,468	0.96	84									
		Stream	53	-	53	112	-	112	7,361	4,901	-	98	-	12,360	2.23	231									
		Total	2,356	623	2,979	2,920	-	2,920	222,535	32,762	-	1,531	-	256,828	0.98	86	2,078	901	2,979	1,566	1,354	2,920	109,520	147,308	256,828
Forest Service -C.C.C.	First Working	Timber	1,176	-	1,176	2,055	-	2,055	184,747	37,876	-	-	428	223,051	1.75	190									
		Stream	17	-	17	101	-	101	3,369	1,578	-	-	3,682	8,629	5.94	508									
		*Mechanical	25	-	25	157	-	157	-	-	-	-	-	-	6.28	-									
		Total	1,218	-	1,218	2,313	-	2,313	188,116	39,454	-	-	4,110	231,680	1.90	190	159	1,059	1,218	397	1,916	2,313	39,909	191,771	231,680
Forest Total	Total	Timber	3,479	623	4,102	4,863	-	4,863	399,921	65,737	-	1,433	428	467,519	1.18	114									
		Stream	70	-	70	213	-	213	10,730	6,479	-	98	3,682	20,989	3.04	300									
		Mechanical	25	-	25	157	-	157	-	-	-	-	-	-	6.28										
		Total	3,574	623	4,197	5,233	-	5,233	410,651	72,216	-	1,531	4,110	488,508	1.24	116	2,237	1,960	4,197	1,963	3,270	5,233	149,429	339,079	488,508
ELDORADO NATIONAL FOREST																									
Bureau -E.R.A.	First Working	Timber	2,376	379	2,755	6,178	5	6,183	875,786	7,877	14,335	13,218	-	911,216	2.24	331									
		Stream	235	-	235	709	-	709	87,611	17,646	1,164	-	-	106,421	3.02	453									
		Cut Over	1,210	120	1,330	2,304	3	2,307	341,904	14,059	-	-	-	355,963	1.73	267									
		Brush	843	211	1,054	3,217	4	3,221	327,503	4,111	-	-	-	331,614	3.06	315									
		Total	4,664	710	5,374	12,408	12	12,420	1,632,804	43,693	15,499	13,218	-	1,705,214	2.31	317	1,540	3,834	5,374	2,765	9,655	12,420	325,188	1,380,026	1,705,214
	Second Working	Timber	2,554	-	2,554	3,004	-	3,004	186,345	2,445	-	-	-	188,790	1.18	74									
		Stream	39	-	39	44	-	44	3,529	1,245	-	-	-	4,774	1.13	122									
		Cut Over	240	-	240	188	-	188	19,182	423	-	-	-	19,605	0.78	82									
		Total	2,833	-	2,833	3,236	-	3,236	209,056	4,113	-	-	-	213,169	1.14	75	722	2,111	2,833	565	2,671	3,236	44,760	168,409	213,169
	Total	Timber	4,930	379	5,309	9,182	5	9,187	1,062,131	10,322	14,335	13,218	-	1,100,006	1.73	207									
		Stream	274	-	274	753	-	753	91,140	18,891	1,164	-	-	111,195	2.75	405									
		Cut Over	1,450	120	1,570	2,492	3	2,495	361,086	14,482	-	-	-	375,568	1.59	259									
		Brush	843	211	1,054	3,217	4	3,221	327,503	4,111	-	-	-	331,614	3.06	315									
		Total	7,497	710	8,207	15,644	12	15,656	1,841,860	47,806	15,499	13,218	-	1,918,383	1.91	234	2,262	5,945	8,207	3,330	12,326	15,656	369,948	1,548,436	1,918,383
Forest Service -E.R.A.	First Working	Timber	-	-	-	498	-	498	36,856	224	262	-	-	37,342	-	-	-	-	-	280	218	498	21,004	16,338	37,342
	Second Working	Timber	1,861	360	2,221	2,756	10	2,766	91,167	13,834	2,165	27	-	107,193	1.24	48									
		Stream	19	-	19	28	-	28	901	332	151	-	-	1,384	1.47	73									
		Total	1,880	360	2,240	2,784	10	2,794	92,068	14,166	2,316	27	-	108,577	1.25	48	2,240	-	2,240	2,794	-	2,794	108,577	-	108,577
	Total	Timber	1,861	360	2,221	3,254	10	3,264	128,023	14,058	2,427	27	-	144,535	1.47	65									
		Stream	19	-	19	28	-	28	901	332	151	-	-	1,384	1.47	73									
		Total	1,880	360	2,240	3,282	10	3,292	128,924	14,390	2,578	27	-	145,919	1.47	65	2,240	-	2,240	3,074	218	3,292	129,581	16,338	145,919
Forest Service -C.C.C.	First Working	Timber	628	-	628	1,023	-	1,023	79,981	739	1	-	-	80,721	1.63	128									
		Stream	-	-	-	9	-	9	2,607	646	-	-	-	3,253	-	-									
		Cut Over	175	-	175	1,359	-	1,359	205,265	6,423	6	-	-	211,694	7.77	1,209									
		Total	803	-	803	2,391	-	2,391	287,853	7,808	7	-	-	295,668	2.98	368	668	135	803	650	1,741	2,391	104,781	190,887	295,668
	Second Working	Timber	40	-	40	29	-	29	3,577	14	-	-	-	3,591	0.72	90									
		Cut Over	425	-	425	245	-	245	19,890	203	-	-	-	20,093	0.58	47									
		Total	465	-	465	274	-	274	23,467	217	-	-	-	23,684	0.59	51	240	225	465	141	133	274	12,220	11,464	23,684
	Total	Timber	668	-	668	1,052	-	1,052	83,558	753	1	-	-	84,312	1.57	126									
		Stream	-	-	-	9	-	9	2,607	646	-	-	-	3,253	-	-									
		Cut Over	600	-	600	1,604	-	1,604	225,155	6,626	6	-	-	231,787	2.67	386									
		Total	1,268	-	1,268	2,665	-	2,665	311,320	8,025	7	-	-	319,352	2.10	252	908	360	1,268	791	1,874	2,665	117,001	202,351	319,352
Forest Service Totals	First Working	Timber	628	-	628	1,521	-	1,521	116,837	963	263	-	-	118,063	2.42	188									
		Stream	-	-	-	9	-	9	2,607	646	-	-	-	3,253	-	-									
		Cut Over	175	-	175	1,359	-	1,359	205,265	6,423	6	-	-	211,694	7.77	1,209									
		Total	803	-	803	2,889	-	2,889	324,709	8,032	269	-	-	333,010	3.60	415	668	135	803	930	1,959	2,889	125,785	207,225	333,010
	Second Working	Timber	1,901	360	2,261	2,785	10	2,795	94,744	13,848	2,165	27	-	110,784	1.24	49									
		Stream	19	-	19	28	-	28	901	332	151	-	-	1,384	1.47	73									
		Cut Over	425	-	425	245	-	245	19,890	203	-	-	-	20,093	0.58	47									
		Total	2,345	360	2,705	3,058	10	3,068	115,535	14,383	2,316	27	-	132,261	1.13	49	2,480	225	2,705	2,935	133	3,068	120,797	11,464	132,261
	Total	Timber	2,529	360	2,889	4,306	10	4,316	211,581	14,811	2,428	27	-	228,847	1.49	59									
		Stream	19	-	19	37	-	37	3,508	978	151	-	-	4,637	1.95	244									
		Cut Over	600	-	600	1,604	-	1,604	225,155	6,626	6	-	-	231,787	2.67	386									
		Total	3,148	360	3,508	5,947	10	5,957	440,244	22,415	2,585	27	-	465,271	1.70	133	3,148	360	3,508	3,865	2,092	5,957	246,582	218,689	465,271
Forest Totals	First Working	Timber	3,004	379	3,383	7,699	5	7,704	992,623	8,840	14,598	13,218	-	1,029,279	2.28	304									
		Stream	235	-	235	718	-	718	90,218	18,292	1,164	-	-	109,674	3.05	467									
		Cut Over	1,385	120	1,505	3,663	3	3,666	547,169	20,482	6	-	-	567,657	2.44	377									
		Brush	843	211	1,054	3,217	4	3,221	327,503	4,111	-	-	-	331,614	3.06	315									
		Total	5,467	710	6,177	15,297	12	15,309	1,957,513	51,725	15,768	13,218	-	2,038,224	2.49	330	2,208	3,969	6,177	3,695	11,614	15,309	450,973	1,587,251	2,038,224
	Second Working	Timber	4,455	360	4,815	5,789	10	5,799	281,089	16,293	2,165	27	-	299,574	1.20	62									
		Stream	58	-	58	72	-	72	4,430	1,577	151	-	-	6,158	1.24	106									
		Cut Over	665	-	665	433	-	433	39,072	626	-	-	-	39,698	0.65	60									
		Total	5,178	360	5,538	6,294	10	6,304	324,591	18,496	2,316	27	-	345,430	1.14	62	3,202	2,336	5,538	3,500	2,804	6,304	165,557	179,873	345,430
	Total	Timber	7,459	739	8,198	13,488	15	13,503	1,273,712	25,133	16,763	13,245	-	1,328,853	1.65	162									
		Stream	293	-	293	790	-	790	94,648	19,869	1,315	-	-	115,832	2.70	395									
		Cut Over	2,050	120	2,170	4,096	3	4,099	586,241	21,108	6	-	-	607,355	1.89	280									
		Brush	843	211	1,054	3,217	4	3,221	327,503	4,111	-	-	-	331,614	3.06	315									
		Total	10,645	1,070	11,715	21,591	22	21,613	2,282,104	70,221	18,084	13,245	-	2,383,654	1.84	203	5,410	6,305	11,715	7,195	14,418	21,613	616,530	1,767,124	2,383,654

TABLE NO. 3 (CONTINUED)

SUMMARY OF RIBES ERADICATION BY OPERATIONS FOR THE SUGAR PINE REGION - 1937

PART A - CALIFORNIA OPERATIONS

Agency	Class of Work	Eradication Type	Acres			Man Days			Ribes by Species					Total Ribes Eradicated	Per Acre Basis		Ownership Status								
			Worked	Blocked Out	Total	Worked	Blocked Out	Total	Ribes roezli	Ribes nevadense	Ribes cereum	Ribes viscosissimum	Ribes inerme		Man Days	Ribes	Acres			Man Days			Ribes		
																	Federal	Private	Total	Federal	Private	Total	Federal	Private	Total
STANISLAUS NATIONAL FOREST																									
Bureau -E.B.A.	First Working	Timber	1,781	-	1,781	2,325	-	2,325	172,334	5,709	247	1,583	-	179,873	1.30	101									
		Stream	26	-	26	192	-	192	73,581	33,302	-	23	-	106,906	7.38	4,112									
		Cut Over	1,228	-	1,228	5,328	-	5,328	2,187,341	30,256	754	-	-	2,218,351	4.34	1,806									
		Brush	59	-	59	609	-	609	276,719	2,875	68	-	-	279,662	10.32	4,740									
		Total	3,094	-	3,094	8,454	-	8,454	2,709,975	72,142	1,069	1,606	-	2,784,792	2.73	900	690	2,404	3,094	980	7,474	8,454	77,990	2,706,802	2,784,792
	Second Working	Timber	3,159	-	3,159	1,219	-	1,219	41,056	4,265	49	104	-	45,474	0.39	14									
		Stream	157	-	157	152	-	152	29,014	5,352	6	-	-	34,372	0.97	219									
		Cut Over	2,013	-	2,013	3,557	-	3,557	413,442	16,519	270	-	-	430,231	1.77	213									
		Brush	25	-	25	23	-	23	600	-	-	-	-	600	0.92	24									
		Total	5,354	-	5,354	4,951	-	4,951	484,112	26,136	325	104	-	510,677	0.92	95	2,786	2,568	5,354	3,714	1,237	4,951	431,941	78,736	510,677
	Third Working	Timber	66	49	115	25	-	25	2,017	-	-	-	-	2,017	0.22	17									
		Stream	39	-	39	9	-	9	930	581	-	-	-	1,511	0.23	38									
		Cut Over	588	-	588	488	-	488	28,472	4,979	27	-	-	33,478	0.83	57									
		Brush	140	-	140	41	-	41	2,752	130	6	-	-	2,888	0.29	21									
		Total	833	49	882	563	-	563	34,171	5,690	33	-	-	39,894	0.64	45	602	280	882	459	104	563	27,649	12,245	39,894
	Fourth Working	Timber	121	216	337	36	-	36	1,301	-	-	-	-	1,301	0.11	4									
		Stream	112	-	112	29	-	29	1,502	1,250	-	-	-	2,752	0.26	25									
		Cut Over	3,011	772	3,783	1,797	-	1,797	80,848	5,737	97	-	-	86,682	0.47	23									
		Total	3,244	988	4,232	1,862	-	1,862	83,651	6,987	97	-	-	90,735	0.44	21	3,952	280	4,232	1,808	54	1,862	88,854	1,881	90,735
	Total	Timber	5,127	265	5,392	3,605	-	3,605	216,708	9,974	296	1,687	-	228,665	0.67	42									
		Stream	334	-	334	382	-	382	105,027	40,485	6	23	-	145,541	1.14	436									
		Cut Over	6,840	772	7,612	11,170	-	11,170	2,710,103	57,491	1,148	-	-	2,768,742	1.47	364									
		Brush	224	-	224	673	-	673	280,071	3,005	74	-	-	283,150	3.00	1,264									
		Total	12,525	1,031	13,562	15,830	-	15,830	3,311,909	110,955	1,524	1,710	-	3,426,098	1.17	253	8,030	5,532	13,562	6,961	8,869	15,830	626,434	2,799,664	3,426,098
Forest Service -E.B.A.	First Working	Timber	2,610	655	3,265	2,857	-	2,857	337,149	7,397	-	-	-	344,546	0.87	105									
		Stream	20	-	20	10	-	10	1,007	314	-	-	-	1,321	0.50	66									
		Total	2,630	655	3,285	2,867	-	2,867	338,156	7,711	-	-	-	345,867	0.87	105	2,705	580	3,285	1,787	1,080	2,867	259,641	86,226	345,867
Forest Totals	First Working	Timber	4,391	655	5,046	5,182	-	5,182	509,483	13,106	247	1,583	-	524,419	1.03	104									
		Stream	46	-	46	202	-	202	74,588	33,616	-	23	-	108,227	4.39	2,353									
		Cut Over	1,228	-	1,228	5,328	-	5,328	2,187,341	30,256	754	-	-	2,218,351	4.34	1,806									
		Brush	59	-	59	609	-	609	276,719	2,875	68	-	-	279,662	10.32	4,740									
		Total	5,724	655	6,379	11,321	-	11,321	3,048,131	79,853	1,069	1,606	-	3,130,659	1.77	491	3,395	2,984	6,379	2,767	8,554	11,321	337,631	2,793,028	3,130,659
	Second Working	Timber	3,159	-	3,159	1,219	-	1,219	41,056	4,265	49	104	-	45,474	0.39	14									
		Stream	157	-	157	152	-	152	29,014	5,352	6	-	-	34,372	0.97	219									
		Cut Over	2,013	-	2,013	3,557	-	3,557	413,442	16,519	270	-	-	430,231	1.77	213									
		Brush	25	-	25	23	-	23	600	-	-	-	-	600	0.92	24									
		Total	5,354	-	5,354	4,951	-	4,951	484,112	26,136	325	104	-	510,677	0.92	95	2,786	2,568	5,354	3,714	1,237	4,951	431,941	78,736	510,677
	Third Working	Timber	66	49	115	25	-	25	2,017	-	-	-	-	2,017	0.22	17									
		Stream	39	-	39	9	-	9	930	581	-	-	-	1,511	0.23	38									
		Cut Over	588	-	588	488	-	488	28,472	4,979	27	-	-	33,478	0.83	57									
		Brush	140	-	140	41	-	41	2,752	130	6	-	-	2,888	0.29	21									
		Total	833	49	882	563	-	563	34,171	5,690	33	-	-	39,894	0.64	45	602	280	882	459	104	563	27,649	12,245	39,894
	Fourth Working	Timber	121	216	337	36	-	36	1,301	-	-	-	-	1,301	0.11	4									
		Stream	112	-	112	29	-	29	1,502	1,250	-	-	-	2,752	0.26	25									
		Cut Over	3,011	772	3,783	1,797	-	1,797	80,848	5,737	97	-	-	86,682	0.47	23									
		Total	3,244	988	4,232	1,862	-	1,862	83,651	6,987	97	-	-	90,735	0.44	21	3,952	280	4,232	1,808	54	1,862	88,854	1,881	90,735
	Total	Timber	7,737	920	8,657	6,462	-	6,462	553,857	17,371	296	1,687	-	573,211	0.75	66									
		Stream	354	-	354	392	-	392	106,034	40,799	6	23	-	146,862	1.10	415									
		Cut Over	6,840	772	7,612	11,170	-	11,170	2,710,103	57,491	1,148	-	-	2,768,742	1.47	363									
		Brush	224	-	224	673	-	673	280,071	3,005	74	-	-	283,150	3.00	1,264									
		Total	15,155	1,692	16,847	18,697	-	18,697	3,650,065	118,666	1,524	1,710	-	3,771,965	1.11	224	10,735	6,112	16,847	8,748	9,949	18,697	886,075	2,885,890	3,771,965
SIERRA NATIONAL FOREST																									
Bureau -E.B.A.	First Working	Timber	4,279	-	4,279	6,765	-	6,765	720,613	29,213	-	-	-	749,826	1.58	175									
		Stream	107	-	107	245	-	245	20,861	17,353	-	-	-	38,214	2.29	357									
		Cut Over	254	-	254	1,377	-	1,377	189,635	8,330	184	-	-	198,149	5.42	780									
		Total	4,640	-	4,640	8,387	-	8,387	931,109	54,896	184	-	-	986,189	1.81	212	3,740	900	4,640	6,674	1,713	8,387	786,283	199,906	986,189
Forest Service -E.R.A.	First Working	Timber	999	324	1,323	2,775	13	2,788	187,557	8,212	-	-	-	195,769	2.11	148									
		Stream	115	-	115	620	-	620	29,877	26,559	1	-	-	56,437	5.39	491									
		Cut Over	1,784	15	1,799	6,972	1	6,973	584,693	35,604	2	-	-	620,299	3.87	345									
		Total	2,898	339	3,237	10,367	14	10,381	802,127	70,375	3	-	-	872,505	3.20	269	3,237	-	3,237	10,381	-	10,381	872,505	-	872,505
Forest Totals	Total	Timber	5,278	324	5,602	9,540	13	9,553	908,170	37,425	-	-	-	945,595	1.70	169									
		Stream	222	-	222	865	-	865	50,738	43,912	1	-	-	94,651	3.90	426									
		Cut Over	2,038	15	2,053	8,349	1	8,350	774,328	43,934	186	-	-	818,448	4.07	399									
		Total	7,538	339	7,877	18,754	14	18,768	1,733,236	125,271	187	-	-	1,858,694	2.38	236	6,977	900	7,877	17,055	1,713	18,768	1,658,788	199,906	1,858,694

TABLE NO. 3 (CONTINUED)

SUMMARY OF RIBES ERADICATION BY OPERATIONS FOR THE SUGAR PINE REGION - 1937

PART A - CALIFORNIA OPERATIONS

Agency	Class of Work	Eradication Type	Acres Worked	Acres Blocked Out	Acres Total	Man Days Worked	Man Days Blocked Out	Man Days Total	Ribes roezli	Ribes nevadense	Ribes cereum	Ribes viscosissimum	Ribes inerme	Total Ribes Eradicated	Per Acre Basis Man Days	Per Acre Basis Ribes	Ownership Status Acres Federal	Acres Private	Acres Total	Man Days Federal	Man Days Private	Man Days Total	Ribes Federal	Ribes Private	Ribes Total
TOTALS - CALIFORNIA OPERATIONS																									
Bureau -E.S.A. Totals	First Working	Timber	8,436	379	8,815	15,268	5	15,273	1,768,733	42,799	14,582	14,801	-	1,840,915	1.73	209									
		Stream	368	-	368	1,146	-	1,146	182,053	68,301	1,164	23	-	251,541	3.11	683									
		Cut Over	2,692	120	2,812	9,009	3	9,012	2,718,880	52,645	938	-	-	2,772,463	3.20	986									
		Brush	902	211	1,113	3,826	4	3,830	604,222	6,986	68	-	-	611,276	3.44	549									
		Total	12,398	710	13,108	29,249	12	29,261	5,273,888	170,731	16,752	14,824	-	5,476,195	2.23	418	5,970	7,138	13,108	10,419	18,842	29,261	1,189,461	4,286,734	5,476,195
	Second Working	Timber	5,713	-	5,713	4,223	-	4,223	227,401	6,710	49	104	-	234,264	0.74	41									
		Stream	196	-	196	196	-	196	32,543	6,597	6	-	-	39,146	1.00	200									
		Cut Over	2,253	-	2,253	3,745	-	3,745	432,624	16,942	270	-	-	449,836	1.66	200									
		Brush	25	-	25	23	-	23	600	-	-	-	-	600	0.92	24									
		Total	8,187	-	8,187	8,187	-	8,187	693,168	30,249	325	104	-	723,846	1.00	88	3,508	4,679	8,187	4,279	3,908	8,187	476,701	247,145	723,84
	Third Working	Timber	66	49	115	25	-	25	2,017	-	-	-	-	2,017	0.22	17									
		Stream	39	-	39	9	-	9	930	581	-	-	-	1,511	0.23	38									
		Cut Over	588	-	588	488	-	488	28,472	4,979	27	-	-	33,478	0.83	57									
		Brush	140	-	140	41	-	41	2,752	130	6	-	-	2,888	0.29	21									
		Total	833	49	882	563	-	563	34,171	5,690	33	-	-	39,894	0.64	45	602	280	882	459	104	563	27,649	12,245	39,89
	Fourth Working	Timber	121	216	337	36	-	36	1,301	-	-	-	-	1,301	0.11	4									
		Stream	112	-	112	29	-	29	1,502	1,250	-	-	-	2,752	0.26	25									
		Cut Over	3,011	772	3,783	1,797	-	1,797	80,848	5,737	97	-	-	86,682	0.47	23									
		Total	3,244	988	4,232	1,862	-	1,862	83,651	6,987	97	-	-	90,735	0.44	21	3,952	280	4,232	1,808	54	1,862	88,854	1,881	90,73
	Total	Timber	14,336	644	14,980	19,552	5	19,557	1,999,452	49,509	14,631	14,905	-	2,078,497	1.31	139									
		Stream	715	-	715	1,380	-	1,380	217,028	76,729	1,170	23	-	294,950	1.93	412									
		Cut Over	8,544	892	9,436	15,039	3	15,042	3,260,824	80,303	1,332	-	-	3,342,459	1.59	354									
		Brush	1,067	211	1,278	3,890	4	3,894	607,574	7,116	74	-	-	614,764	3.05	481									
		Total	24,662	1,747	26,409	39,861	12	39,873	6,084,878	213,657	17,207	14,928	-	6,330,670	1.51	240	14,032	12,377	26,409	16,965	22,908	39,873	1,782,665	4,548,005	6,330,67
Forest Service -E.S.A. Totals	First Working	Timber	5,912	1,602	7,514	8,938	13	8,951	776,736	43,694	262	1,433	-	822,125	1.19	109									
		Stream	188	-	188	742	-	742	38,245	31,774	1	98	-	70,118	3.94	373									
		Cut Over	1,784	15	1,799	6,972	1	6,973	584,693	35,604	2	-	-	620,299	3.88	345									
		Total	7,884	1,617	9,501	16,652	14	16,666	1,399,674	111,072	265	1,531	-	1,512,542	1.75	159	8,020	1,481	9,501	14,014	2,652	16,666	1,262,670	249,872	1,512,54
	Second Working	Timber	1,861	360	2,221	2,756	10	2,766	91,167	13,834	2,165	27	-	107,193	1.24	48									
		Stream	19	-	19	28	-	28	901	332	151	-	-	1,384	1.47	73									
		Total	1,880	360	2,240	2,784	10	2,794	92,068	14,166	2,316	27	-	108,577	1.25	48	2,240	-	2,240	2,794	-	2,794	108,577	-	108,57
	Total	Timber	7,773	1,962	9,735	11,694	23	11,717	867,903	57,528	2,427	1,460	-	929,318	1.20	95									
		Stream	207	-	207	770	-	770	39,146	32,106	152	98	-	71,502	3.71	345									
		Cut Over	1,784	15	1,799	6,972	1	6,973	584,693	35,604	2	-	-	620,299	3.88	345									
		Total	9,764	1,977	11,741	19,436	24	19,460	1,491,742	125,238	2,581	1,558	-	1,621,119	1.66	138	10,260	1,481	11,741	16,808	2,652	19,460	1,371,247	249,872	1,621,11
Forest Service -C.C.C. Totals	First Working	Timber	1,804	-	1,804	3,078	-	3,078	264,728	38,615	1	-	428	303,772	1.71	168									
		Stream	17	-	17	110	-	110	5,976	2,224	-	-	3,682	11,882	6.47	699									
		Cut Over	175	-	175	1,359	-	1,359	205,265	6,423	6	-	-	211,694	7.76	1,209									
		*Mechanical	25	-	25	157	-	157	-	-	-	-	-	-	6.28	-									
		Total	2,021	-	2,021	4,704	-	4,704	475,969	47,262	7	-	4,110	527,348	2.33	261	827	1,194	2,021	1,047	3,657	4,704	144,690	382,658	527,34
	Second Working	Timber	40	-	40	29	-	29	3,577	14	-	-	-	3,591	0.72	89									
		Cut Over	425	-	425	245	-	245	19,890	203	-	-	-	20,093	0.58	47									
		Total	465	-	465	274	-	274	23,467	217	-	-	-	23,684	0.59	51	240	225	465	141	133	274	12,220	11,464	23,68
	Total	Timber	1,844	-	1,844	3,107	-	3,107	268,305	38,629	1	-	428	307,363	1.68	167									
		Stream	17	-	17	110	-	110	5,976	2,224	-	-	3,682	11,882	6.47	699									
		Cut Over	600	-	600	1,604	-	1,604	225,155	6,626	6	-	-	231,787	2.67	386									
		Mechanical	25	-	25	157	-	157	-	-	-	-	-	-	6.28	-									
		Total	2,486	-	2,486	4,978	-	4,978	499,436	47,479	7	-	4,110	551,032	2.00	222	1,067	1,419	2,486	1,188	3,790	4,978	156,910	394,122	551,03
Forest Service Totals	First Working	Timber	7,716	1,602	9,318	12,016	13	12,029	1,041,464	82,309	263	1,433	428	1,125,897	1.29	121									
		Stream	205	-	205	852	-	852	44,221	33,998	1	98	3,682	82,000	4.16	400									
		Cut Over	1,959	15	1,974	8,331	1	8,332	789,958	42,027	8	-	-	831,993	4.22	421									
		*Mechanical	25	-	25	157	-	157	-	-	-	-	-	-	6.28	-									
		Total	9,905	1,617	11,522	21,356	14	21,370	1,875,643	158,334	272	1,531	4,110	2,039,890	1.85	177	8,847	2,675	11,522	15,061	6,309	21,370	1,407,360	632,530	2,039,89
	Second Working	Timber	1,901	360	2,261	2,785	10	2,795	94,744	13,848	2,165	27	-	110,784	1.20	49									
		Stream	19	-	19	28	-	28	901	332	151	-	-	1,384	1.47	73									
		Cut Over	425	-	425	245	-	245	19,890	203	-	-	-	20,093	0.58	47									
		Total	2,345	360	2,705	3,058	10	3,068	115,535	14,383	2,316	27	-	132,261	1.13	49	2,480	225	2,705	2,935	133	3,068	120,797	11,464	132,26
	Total	Timber	9,617	1,962	11,579	14,801	23	14,824	1,136,208	96,157	2,428	1,460	428	1,236,681	1.28	107									
		Stream	224	-	224	880	-	880	45,122	34,330	152	98	3,682	83,384	3.93	372									
		Cut Over	2,384	15	2,399	8,576	1	8,577	809,848	42,230	8	-	-	852,086	3.57	355									
		Mechanical	25	-	25	157	-	157	-	-	-	-	-	-	6.28	-									
		Total	12,250	1,977	14,227	24,414	24	24,438	1,991,178	172,717	2,588	1,558	4,110	2,172,151	1.72	153	11,327	2,900	14,227	17,996	6,442	24,438	1,528,157	643,994	2,172,15
Total All Agencies	First Working	Timber	16,152	1,981	18,133	27,284	18	27,302	2,810,197	125,108	14,845	16,234	428	2,966,812	1.50	164									
		Stream	573	-	573	1,998	-	1,998	226,274	102,299	1,165	121	3,682	333,541	3.48	582									
		Cut Over	4,651	135	4,786	17,340	4	17,344	3,508,838	94,672	946	-	-	3,604,456	3.62	753									
		Brush	902	211	1,113	3,826	4	3,830	604,222	6,986	68	-	-	611,276	3.49	549									
		*Mechanical	25	-	25	157	-	157	-	-	-	-	-	-	6.28	-									
		Total	22,303	2,327	24,630	50,605	26	50,631	7,149,531	329,065	17,024	16,355	4,110	7,516,085	2.05	305	14,817	9,813	24,630	25,480	25,151	50,631	2,596,821	4,919,264	7,516,08
	Second Working	Timber	7,614	360	7,974	7,008	10	7,018	322,145	20,558	2,214	131	-	345,048	0.88	43									
		Stream	215	-	215	224	-	224	33,444	6,929	157	-	-	40,530	1.04	188									
		Cut Over	2,678	-	2,678	3,990	-	3,990	452,514	17,145	270	-	-	469,929	1.49	175									
		Brush	25	-	25	23	-	23	600	-	-	-	-	600	0.92	24									
		Total	10,532	360	10,892	11,245	10	11,255	808,703	44,632	2,641	131	-	856,107	1.03	78	5,988	4,904	10,892	7,214	4,041	11,255	597,498	258,609	856,1
	Third Working	Timber	66	49	115	25	-	25	2,017	-	-	-	-	2,017	0.22	17									
		Stream	39	-	39	9	-	9	930	581	-	-	-	1,511	0.23	39									
		Cut Over	588	-	588	488	-	488	28,472	4,979	27	-	-	33,478	0.83	57									
		Brush	140	-	140	41	-	41	2,752	130	6	-	-	2,888	0.29	21									
		Total	833	49	882	563	-	563	34,171	5,690	33	-	-	39,894	0.64	45	602	280	882	459	104	563	27,649	12,245	39,8
	Fourth Working	Timber	121	216	337	36	-	36	1,301	-	-	-	-	1,301	0.11	4									
		Stream	112	-	112	29	-	29	1,502	1,250	-	-	-	2,752	0.26	26									
		Cut Over	3,011	772	3,783	1,797	-	1,797	80,848	5,737	97	-	-	86,682	0.47	23									
		Total	3,244	988	4,232	1,862	-	1,862	83,651	6,987	97	-	-	90,735	0.44	21	3,952	280	4,232	1,808	54	1,862	88,854	1,881	90,7
	Total	Timber	23,953	2,606	26,559	34,353	28	34,381	3,135,660	145,666	17,059	16,365	428	3,315,178	1.29	125									
		Stream	939	-	939	2,260	-	2,260	262,150	111,059	1,322	121	3,682	378,334	2.40	403									
		Cut Over	10,928	907	11,835	23,615	4	23,619	4,070,672	122,533	1,340	-	-	4,194,545	1.99	354									
		Brush	1,067	211	1,278	3,890	4	3,894	607,574	7,116	74	-	-	614,764	3.04	481									
		Mechanical	25	-	25	157	-	157	-	-	-	-	-	-	6.28	-									
		Total	36,912	3,724	40,636	64,275	36	64,311	8,076,056	386,374	19,795	16,486	4,110	8,502,821	1.58	209	25,359	15,277	40,636	34,961	29,350	64,311	3,310,822	5,191,999	8,502,8

*It is estimated that 25,000 Ribes were destroyed by mechanical means.

TABLE NO. 3 (CONTINUED)

SUMMARY OF RIBES ERADICATION BY OPERATIONS FOR THE SUGAR PINE REGION - 1937

PART B - OREGON OPERATIONS

Agency	Class of Work	Eradication Type	Acres Worked	Acres Blocked Out	Acres Total	Man Days	Ribes binominatum	Ribes bracteosum	Ribes cereum	Ribes cruentum	Ribes erythrocarpum	Ribes klamathense	Ribes lacustre	Ribes lobbii	Ribes sanguineum	Ribes triste	Ribes viscosissimum	Total Ribes Eradicated	Per Acre Basis Man Days	Per Acre Basis Ribes
ROGUE RIVER NATIONAL FOREST																				
Bureau - E.R.A.	First Working	Timber	741	120	861	1,596	173,132	2,077	124,245	662	6,960	5	76,609	3,461	31	-	31,507	418,689	1.85	486
		Stream	142	-	142	367	38,322	6,905	39	171	89	-	52,288	422	650	-	2,522	101,408	2.58	714
		Cut Over	23	-	23	24	320	-	3,642	95	-	-	1,310	89	-	-	6	5,462	1.04	237
		Total	906	120	1,026	1,987	211,774	8,982	127,926	928	7,049	5	130,207	3,972	681	-	34,035	525,559	1.94	512
	Second Working	Timber	2,968	11,335	14,303	1,659	88,477	106	3,925	9,136	132	1,229	18,553	4,797	2,502	175	1,342	130,374	.12	9
		Stream	2,082	144	2,226	1,512	86,987	12,350	179	264	8	45,087	80,445	1,557	3,913	9,910	349	241,049	.68	108
		Cut Over	540	1,731	2,271	178	-	-	101	1,472	-	1,921	1,057	170	1,360	-	27	6,108	.08	3
		Brush	33	-	33	16	-	-	106	-	-	-	127	372	37	-	-	642	.48	19
		Total	5,623	13,210	18,833	3,365	175,464	12,456	4,311	10,872	140	48,237	100,182	6,896	7,812	10,085	1,718	378,173	.18	20
	Total	Timber	3,709	11,455	15,164	3,255	261,609	2,183	128,170	9,798	7,092	1,234	95,162	8,258	2,533	175	32,849	549,063	.31	362
		Stream	2,224	144	2,368	1,879	125,309	19,255	218	435	97	45,087	132,733	1,979	4,563	9,910	2,871	342,457	.79	144
		Cut Over	563	1,731	2,294	202	320	-	3,743	1,567	-	1,921	2,367	259	1,360	-	33	11,570	.08	5
		Brush	33	-	33	16	-	-	106	-	-	-	127	372	37	-	-	642	.5	19
		Total	6,529	13,330	19,859	5,352	387,238	21,438	132,237	11,800	7,189	48,242	230,389	10,868	8,493	10,085	35,753	903,732	.27	45
SISKIYOU NATIONAL FOREST																				
Bureau E.R.A.	First Working	Timber	32	218	250	11	-	-	-	104	-	-	-	-	-	-	-	104	.04	.4
CRATER LAKE NATIONAL PARK																				
Crater Lake Nat. Park - C.C.C.	First Working	Timber	336	809	1,145	501	-	-	21,073	-	98,348	-	240	-	-	-	252	119,913	.44	105
TOTALS - OREGON OPERATIONS																				
Total All Agencies	First Working	Timber	1,109	1,147	2,256	2,108	173,132	2,077	145,318	766	6,960	5	76,849	3,461	31	-	31,759	538,706	.93	238
		Stream	142	-	142	367	38,322	6,905	39	171	89	-	52,288	422	650	-	2,522	101,408	2.58	714
		Cut Over	23	-	23	24	320	-	3,642	95	-	-	1,310	89	-	-	6	5,462	1.04	237
		Total	1,274	1,147	2,421	2,499	211,774	8,982	148,999	1,032	7,049	5	130,447	3,972	681	-	34,287	645,576	1.03	267
	Second Working	Timber	2,968	11,335	14,303	1,659	88,477	106	3,925	9,136	132	1,229	18,553	4,797	2,502	175	1,342	130,374	.12	9
		Stream	2,082	144	2,226	1,512	86,987	12,350	179	264	8	45,087	80,445	1,557	3,113	9,910	349	241,049	.67	108
		Cut Over	540	1,731	2,271	178	-	-	101	1,472	-	1,921	1,057	170	1,360	-	27	6,108	.08	3
		Brush	33	-	33	16	-	-	106	-	-	-	127	372	37	-	-	642	.48	19
		Total	5,623	13,210	18,833	3,365	175,464	12,456	4,311	10,872	140	48,237	100,182	6,896	7,812	10,085	1,718	378,173	.18	20
		Timber	4,077	12,482	16,559	3,767	261,609	2,183	149,243	9,902	105,440	1,234	95,402	8,258	2,533	175	33,101	669,080	.23	40
		Stream	2,224	144	2,368	1,879	125,309	19,255	218	435	97	45,087	132,733	1,979	4,563	9,910	2,871	342,457	.79	144
		Cut Over	563	1,731	2,294	202	320	-	3,743	1,567	-	1,921	2,367	259	1,360	-	33	11,570	.08	5
		Brush	33	-	33	16	-	-	106	-	-	-	127	372	37	-	-	642	.48	19
		Total	6,897	14,357	21,254	5,864	387,238	21,438	153,310	11,904	105,537	48,242	230,629	10,868	8,493	10,085	36,005	1,023,749	.28	48

SUMMARY BY OWNERSHIP

Control Unit	Agency	Class of Work	Acres Federal National Forest	Acres Federal O & C	Acres Federal National Park	Acres Federal Total	Acres Private	Acres Total	Man Days Federal National Forest	Man Days Federal O & C	Man Days Federal National Park	Man Days Federal Total	Man Days Private	Man Days Total	Ribes Federal National Forest	Ribes Federal O & C	Ribes Federal National Park	Ribes Federal Total	Ribes Private	Ribes Total
Rogue River National Forest	Bureau E.R.A.	First Working	1,026	-	-	1,026	-	1,026	1,987	-	-	1,987	-	1,987	525,559	-	-	525,559	-	525,559
		Second Working	8,619	-	-	8,619	10,214	18,833	2,238	-	-	2,238	1,127	3,365	316,047	-	-	316,047	62,126	378,173
		Total	9,645	-	-	9,645	10,214	19,859	4,225	-	-	4,225	1,127	5,352	841,606	-	-	841,606	62,126	903,732
Siskiyou National Forest	Bureau E.R.A.	First Working	205	45	-	250	-	250	10	1	-	11	-	11	104	-	-	104	-	104
Crater Lake National Park	C.C.C.	First Working	-	-	1,145	1,145	-	1,145	-	-	501	501	-	501	-	-	119,913	119,913	-	119,913
Total All Control Units	All Agencies	First Working	1,231	45	1,145	2,421	-	2,421	1,997	1	501	2,499	-	2,499	525,663	-	119,913	645,576	-	645,576
		Second Working	8,619	-	-	8,619	10,214	18,833	2,238	-	-	2,238	1,127	3,365	316,047	-	-	316,047	62,126	378,173
		Total	9,850	45	1,145	11,040	10,214	21,254	4,235	1	501	4,737	1,127	5,864	841,710	-	119,913	961,623	62,126	1,023,749

TABLE NO. 3 (CONCLUDED)

SUMMARY OF RIBES ERADICATION BY OPERATIONS FOR THE SUGAR PINE REGION - 1937

PART C - CALIFORNIA AND OREGON OPERATIONS

			Acres			Man Days				Per Acre Basis		Ownership Status								
												Acres			Man Days			Ribes		
Agency	Class of Work	Eradication Type	Worked	Blocked Out	Total	Worked	Blocked Out	Total	Total Ribes Eradicated	Man Days	Ribes	Federal	Private	Total	Federal	Private	Total	Federal	Private	Total
TOTAL ALL OPERATIONS - NATIONAL FORESTS																				
Bureau - E.R.A.	First Working	Timber	9,209	717	9,926	16,375	5	16,380	2,259,708	1.70	228									
		Stream	510	-	510	1,513	-	1,513	352,949	2.97	692									
		Cut Over	2,715	120	2,835	9,033	3	9,036	2,777,325	3.19	980									
		Brush	902	211	1,113	3,826	4	3,830	611,276	3.44	549									
		Total	13,336	1,048	14,384	31,247	12	31,259	6,001,858	2.17	417	7,246	7,138	14,384	12,417	18,842	31,259	1,715,124	4,286,734	6,001,858
	Second Working	Timber	8,681	11,335	20,016	5,882	-	5,882	364,638	0.29	18									
		Stream	2,278	144	2,422	1,708	-	1,708	280,195	0.71	116									
		Cut Over	2,793	1,731	4,524	3,923	-	3,923	455,944	0.87	101									
		Brush	58	-	58	39	-	39	1,242	0.67	21									
		Total	13,810	13,210	27,020	11,552	-	11,552	1,102,019	0.43	41	12,127	14,893	27,020	6,517	5,035	11,552	792,748	309,271	1,102,019
	Third Working	Timber	66	49	115	25	-	25	2,017	0.22	18									
		Stream	39	-	39	9	-	9	1,511	0.23	39									
		Cut Over	588	-	588	488	-	488	33,478	0.83	57									
		Brush	140	-	140	41	-	41	2,888	0.29	21									
		Total	833	49	882	563	-	563	39,894	0.64	45	602	280	882	459	104	563	27,649	12,245	39,894
	Fourth Working	Timber	121	216	337	36	-	36	1,301	0.11	4									
		Stream	112	-	112	29	-	29	2,752	0.26	25									
		Cut Over	3,011	772	3,783	1,797	-	1,797	86,682	0.48	23									
		Total	3,244	988	4,232	1,862	-	1,862	90,735	0.44	21	3,952	280	4,232	1,808	54	1,862	88,854	1,881	90,735
	Total	Timber	18,077	12,317	30,394	22,818	5	22,823	2,627,664	0.75	86									
		Stream	2,939	144	3,083	3,259	-	3,259	637,407	1.06	207									
		Cut Over	9,107	2,623	11,730	15,241	3	15,244	3,354,029	1.30	286									
		Brush	1,100	211	1,311	3,906	4	3,910	615,406	2.98	469									
		Total	31,223	15,295	46,518	45,224	12	45,236	7,234,506	0.97	156	23,927	22,591	46,518	21,201	24,035	45,035	2,624,375	4,610,131	7,234,506
Forest Service - E.R.A.	First Working	Timber	5,912	1,602	7,514	8,938	13	8,951	822,125	1.19	109									
		Stream	188	-	188	742	-	742	70,118	3.95	373									
		Cut Over	1,784	15	1,799	6,972	1	6,973	620,299	3.88	345									
		Total	7,884	1,617	9,501	16,652	14	16,666	1,512,542	1.75	159	8,020	1,481	9,501	14,014	2,652	16,666	1,262,670	249,872	1,512,542
	Second Working	Timber	1,861	360	2,221	2,756	10	2,766	107,193	1.25	48									
		Stream	19	-	19	28	-	28	1,384	1.47	73									
		Total	1,880	360	2,240	2,784	10	2,794	108,577	1.25	48	2,240	-	2,240	2,794	-	2,794	108,577	-	108,577
	Total	Timber	7,773	1,962	9,735	11,694	23	11,717	929,318	1.20	95									
		Stream	207	-	207	770	-	770	71,502	3.72	345									
		Cut Over	1,784	15	1,799	6,972	1	6,973	620,299	3.88	345									
		Total	9,764	1,977	11,741	19,436	24	19,460	1,621,119	1.66	138	10,260	1,481	11,741	16,808	2,652	19,460	1,371,247	249,872	1,621,119
Forest Service - C.C.C.	First Working	Timber	1,804	-	1,804	3,078	-	3,078	303,772	1.71	168									
		Stream	17	-	17	110	-	110	11,882	6.47	699									
		Cut Over	175	-	175	1,359	-	1,359	211,694	7.77	1,210									
		*Mechanical	25	-	25	157	-	157	-	6.28	-									
		Total	2,021	-	2,021	4,704	-	4,704	527,348	2.33	261	827	1,194	2,021	1,047	3,657	4,704	144,690	382,658	527,348
	Second Working	Timber	40	-	40	29	-	29	3,591	0.73	90									
		Cut Over	425	-	425	245	-	245	20,093	0.58	47									
		Total	465	-	465	274	-	274	23,684	0.59	51	240	225	465	141	133	274	12,220	11,464	23,684
	Total	Timber	1,844	-	1,844	3,107	-	3,107	307,363	1.68	167									
		Stream	17	-	17	110	-	110	11,882	6.47	699									
		Cut Over	600	-	600	1,604	-	1,604	231,787	2.67	386									
		Mechanical	25	-	25	157	-	157	-	6.28	-									
		Total	2,486	-	2,486	4,978	-	4,978	551,032	2.00	222	1,067	1,419	2,486	1,188	3,790	4,978	156,910	394,122	551,032
Forest Service - Total	First Working	Timber	7,716	1,602	9,318	12,016	13	12,029	1,125,897	1.29	121									
		Stream	205	-	205	852	-	852	82,000	4.16	400									
		Cut Over	1,959	15	1,974	8,331	1	8,332	831,993	4.22	421									
		Mechanical	25	-	25	157	-	157	-	6.28	-									
		Total	9,905	1,617	11,522	21,356	14	21,370	2,039,890	1.85	177	8,847	2,675	11,522	15,061	6,309	21,370	1,407,360	632,530	2,039,890
	Second Working	Timber	1,901	360	2,261	2,785	10	2,795	110,784	1.24	49									
		Stream	19	-	19	28	-	28	1,384	1.47	73									
		Cut Over	425	-	425	245	-	245	20,093	0.58	47									
		Total	2,345	360	2,705	3,058	10	3,068	132,261	1.13	49	2,480	225	2,705	2,935	133	3,068	120,797	11,464	132,261
	Total	Timber	9,617	1,962	11,579	14,801	23	14,824	1,236,681	1.28	107									
		Stream	224	-	224	880	-	880	83,384	3.92	372									
		Cut Over	2,384	15	2,399	8,576	1	8,577	852,086	3.58	355									
		Mechanical	25	-	25	157	-	157	-	6.28	-									
		Total	12,250	1,977	14,227	24,414	24	24,438	2,172,151	1.72	153	11,327	2,900	14,227	17,996	6,442	24,438	1,528,157	643,994	2,172,151
TOTAL ALL OPERATIONS - NATIONAL PARKS																				
Park Service C.C.C.	First Working	Timber	336	809	1,145	501	-	501	119,913	0.44	105	1,145	-	1,145	501	-	501	119,913	-	119,913
GRAND TOTALS																				
Total All Agencies	First Working	Timber	17,261	3,128	20,389	29,392	18	29,410	3,505,518	1.44	172									
		Stream	715	-	715	2,365	-	2,365	434,949	3.31	608									
		Cut Over	4,674	135	4,809	17,364	4	17,368	3,609,918	3.61	751									
		Brush	902	211	1,113	3,826	4	3,830	611,276	3.44	549									
		*Mechanical	25	-	25	157	-	157	-	6.28	-									
		Total	23,577	3,474	27,051	53,104	26	53,130	8,161,661	1.96	302	17,238	9,813	27,051	27,979	25,151	53,130	3,242,397	4,919,264	8,161,661
	Second Working	Timber	10,582	11,695	22,277	8,667	10	8,677	475,422	0.39	21									
		Stream	2,297	144	2,441	1,736	-	1,736	281,579	0.71	115									
		Cut Over	3,218	1,731	4,949	4,168	-	4,168	476,037	0.84	96									
		Brush	58	-	58	39	-	39	1,242	0.67	21									
		Total	16,155	13,570	29,725	14,610	10	14,620	1,234,280	0.49	42	14,607	15,118	29,725	9,452	5,168	14,620	913,545	302,735	1,234,280
	Third Working	Timber	66	49	115	25	-	25	2,017	0.22	18									
		Stream	39	-	39	9	-	9	1,511	0.23	39									
		Cut Over	588	-	588	488	-	488	33,478	0.83	57									
		Brush	140	-	140	41	-	41	2,888	0.29	21									
		Total	833	49	882	563	-	563	39,894	0.64	45	602	280	882	459	104	563	27,649	12,245	39,894
	Fourth Working	Timber	121	216	337	36	-	36	1,301	0.11	4									
		Stream	112	-	112	29	-	29	2,752	0.26	25									
		Cut Over	3,011	772	3,783	1,797	-	1,797	86,682	0.48	23									
		Total	3,244	988	4,232	1,862	-	1,862	90,735	0.44	21	3,952	280	4,232	1,808	54	1,862	88,854	1,881	90,735
	Total	Timber	28,030	15,088	43,118	38,120	28	38,148	3,984,258	0.88	92									
		Stream	3,163	144	3,307	4,139	-	4,139	720,791	1.25	218									
		Cut Over	11,491	2,638	14,129	23,817	4	23,821	4,206,115	1.69	298									
		Brush	1,100	211	1,311	3,906	4	3,910	615,406	2.98	469									
		Mechanical	25	-	25	157	-	157	-	6.28	-									
		Total	43,809	18,081	61,890	70,139	36	70,175	9,526,570	1.13	154	36,399	25,491	61,890	39,698	30,477	70,175	4,272,445	5,254,125	9,526,570

* It is estimated that 25,000 Ribes were destroyed by mechanical means.

TABLE NO. 4

SUMMARY OF EMPLOYMENT FINANCED BY ERA FUNDS (WPA) FROM
JANUARY 1 to DECEMBER 31, 1937

SUGAR PINE REGION

State	Operation (Bureau)	Total Number of Persons Employed and Man Months of Employment (120 Hrs. Per Man Month for Non-Appointed Persons in Field)								Maximum Number of Persons Employed at One Time (Average During Week of 6/20-26)			
		Relief*		Non-Relief		Appointed		Total					
		No. of Persons	Man Months	No. of Persons	Man Months	No. of Persons	Man Months	No. of Persons	Man Months	Relief	Non-Relief	Appointed	Total
Calif.	Eldorado	782	1,134	6	11	16	47	804	1,192	337	1	10	348
	Stanislaus	663	970	2	4	16	52	681	1,026	279	-	11	290
	Sierra	251	597	-	-	5	18½	256	615½	143	-	3	146
	Misc.**	35	647	3	2½	17	105½	55	755	22	-	6	28
	Totals	1,731	3,348	11	17½	54	223	1,796	3,588½	781	1	30	812
Oregon	Rogue River	225	597	-	-	3	10½	228	607½	119	-	3	122
Sugar Pine Region	All Operations	1,956	3,945	11	17½	***57	233½	2,024	4,196	900	1	33	934

* Based on number of completed assignments.

** The Oakland and Berkeley offices, the Oakland warehouse, the scouting project and the man months from the winter camp (Sierra operation - Jan. 1 to May 5; Nov. 6 to Dec. 31. 1937) are included herein. In the appointed total for this column are included all permanent overhead for each operation including Oregon who were paid at any time during the year from ERA funds.

*** Of this number. 15 were taken from relief rolls.

TABLE NO. 5

ADJUSTED STATEMENT OF COST FOR THE SUGAR PINE REGION RIBES ERADICATION PROJECTS - 1937

Agency	Classification of Expenditures		Sugar Pine Region: California: Plumas	Sierra	Eldorado	Stanislaus	Sub-Total	Oregon	Total Sugar Pine Region
Bureau	Salaries - Permanent Personnel		$ 4,952.34	$ 5,845.44	$ 7,641.45	$ 7,316.46	$ 25,756.19	$ 7,843.26	$ 33,599.45
	Wages - Temporary Personnel		8.05	34,613.57	42,827.91	37,332.62	114,782.15	26,759.97	141,542.12
	Equipment - Non and Semi Expendable		809.12	1,096.84	960.70	952.82	3,819.48	1,489.69	5,309.17
	Subsistence		-	13,777.16	20,878.78	20,544.53	55,200.47	5,798.99	60,999.46
	Other Supplies and Expenses		273.09	3,220.53	2,308.38	2,099.96	7,901.96	2,402.38	10,304.34
	Transportation and Travel		2,585.66	4,577.50	5,454.02	4,862.81	17,479.99	2,513.48	19,993.47
	Gross Expenditures		8,628.76	63,131.04	80,071.24	73,109.20	224,940.24	46,807.77	271,748.01
	Plus	1/3 cost of Equipment Purchased: 1935	-	931.37	2,794.11	2,794.11	6,519.59	5,451.15	11,970.74
		1936	-	304.62	913.86	913.86	2,132.34	1,160.35	3,292.69
		Supplies on Hand - 1/1/37	* -	3,229.33	2,880.14	1,566.27	7,675.74	**4,291.02	11,966.76
	Gross Cost - Bureau Operation		8,628.76	67,596.36	86,659.35	78,383.44	241,267.91	57,710.29	298,978.20
	Less	2/3 cost of Equipment Purchased - 1937	539.41	731.22	640.46	635.21	2,546.30	993.13	3,539.43
		Supplies on Hand - 12/31/37: Twine	-	239.06	717.17	717.17	1,673.40	500.00	2,173.40
		Food	-	2,294.22	543.52	268.91	3,106.65	609.74	3,716.39
		Non Eradication Charges	2,466.64	21,954.26	250.00	-	24,670.90	6,240.09	30,910.99
	Net Cost - Bureau Operation		5,622.71	42,377.60	84,508.20	76,762.15	209,270.66	49,367.33	258,637.99
Forest Service	Salaries - Permanent Personnel		1,614.19	2,553.54	1,299.96	1,543.28	7,010.97	-	7,010.97
	Wages - Temporary Personnel		10,277.51	25,788.57	8,522.61	6,736.26	51,324.95	-	51,324.95
	Equipment - Non and Semi Expendable		-	1,308.50	-	-	1,308.50	-	1,308.50
	Subsistence		3,400.94	15,797.12	4,475.93	3,883.96	27,557.95	-	27,557.95
	Other Supplies and Expenses		417.98	2,122.14	134.39	141.62	2,816.13	-	2,816.13
	Transportation and Travel		1,746.19	3,324.98	1,251.85	352.94	6,675.96	-	6,675.96
	Gross Expenditures		17,456.81	50,894.85	15,684.74	12,658.06	96,694.46	-	96,694.46
	Plus	1/3 cost of Equipment Purchased: 1935	931.37	2,794.11	931.37	931.37	5,588.22	-	5,588.22
		1936	304.62	913.86	304.62	304.62	1,827.72	-	1,827.72
		Supplies on Hand - 1/1/37	-	1,076.56	-	-	1,076.56	-	1,076.56
	Gross Cost - Forest Service Operation		18,692.80	55,679.38	16,920.73	13,894.05	105,186.96	-	105,186.96
	Less	2/3 cost of Equipment Purchased - 1937	-	872.33	-	-	872.33	-	872.33
		Supplies on Hand - 12/31/37: Twine	80.60	241.80	80.60	80.60	483.60	-	483.60
		Food	-	-	203.07	-	203.07	-	203.07
		Non Eradication Charges	1,223.76	2,635.10	1,696.79	-	5,555.65	-	5,555.65
	Net Cost - Forest Service Operation		17,388.44	51,930.15	14,940.27	13,813.45	98,072.31	-	98,072.31
Total All Agencies	Salaries - Permanent Personnel		6,567.03	8,398.98	8,941.41	8,859.74	32,767.16	7,843.26	40,610.42
	Wages - Temporary Personnel		10,285.56	60,402.14	51,350.52	44,068.88	166,107.10	26,759.97	192,867.07
	Equipment - Non and Semi Expendable		809.12	2,405.34	960.70	952.82	5,127.98	1,489.69	6,617.67
	Subsistence		3,400.94	29,574.28	25,354.71	24,428.49	82,758.42	5,798.99	88,557.41
	Other Supplies and Expenses		691.07	5,342.67	2,442.77	2,241.58	10,718.09	2,402.38	13,120.47
	Transportation and Travel		4,331.85	7,902.48	6,705.87	5,215.75	24,155.95	2,513.48	26,669.43
	Gross Expenditures		26,085.57	114,025.89	95,755.98	85,767.26	321,634.70	46,807.77	368,442.47
	Plus	1/3 cost of Equipment Purchased: 1935	931.37	3,725.48	3,725.48	3,725.48	12,107.81	5,451.15	17,558.96
		1936	304.62	1,218.48	1,218.48	1,218.48	3,960.06	1,160.35	5,120.41
		Supplies on Hand - 1/1/37	-	4,305.89	2,880.14	1,566.27	8,752.30	4,291.02	13,043.32
	Gross Cost - All Agencies		27,321.56	123,275.74	103,580.08	92,277.49	346,454.87	57,710.29	404,165.16
	Less	2/3 cost of Equipment Purchased - 1937	539.41	1,603.55	640.46	635.21	3,418.63	993.13	4,411.76
		Supplies on Hand - 12/31/37: Twine	80.60	480.86	797.77	797.77	2,157.00	500.00	2,657.00
		Food	-	2,294.22	746.59	268.91	3,309.72	609.74	3,919.46
		Non Eradication Charges	3,690.40	24,589.36	1,946.79	-	30,226.55	6,240.09	36,466.64
	Net Cost - All Agencies		$23,011.15	$94,307.75	$99,443.47	$90,575.60	$307,342.97	$ 49,367.33	$ 356,710.30

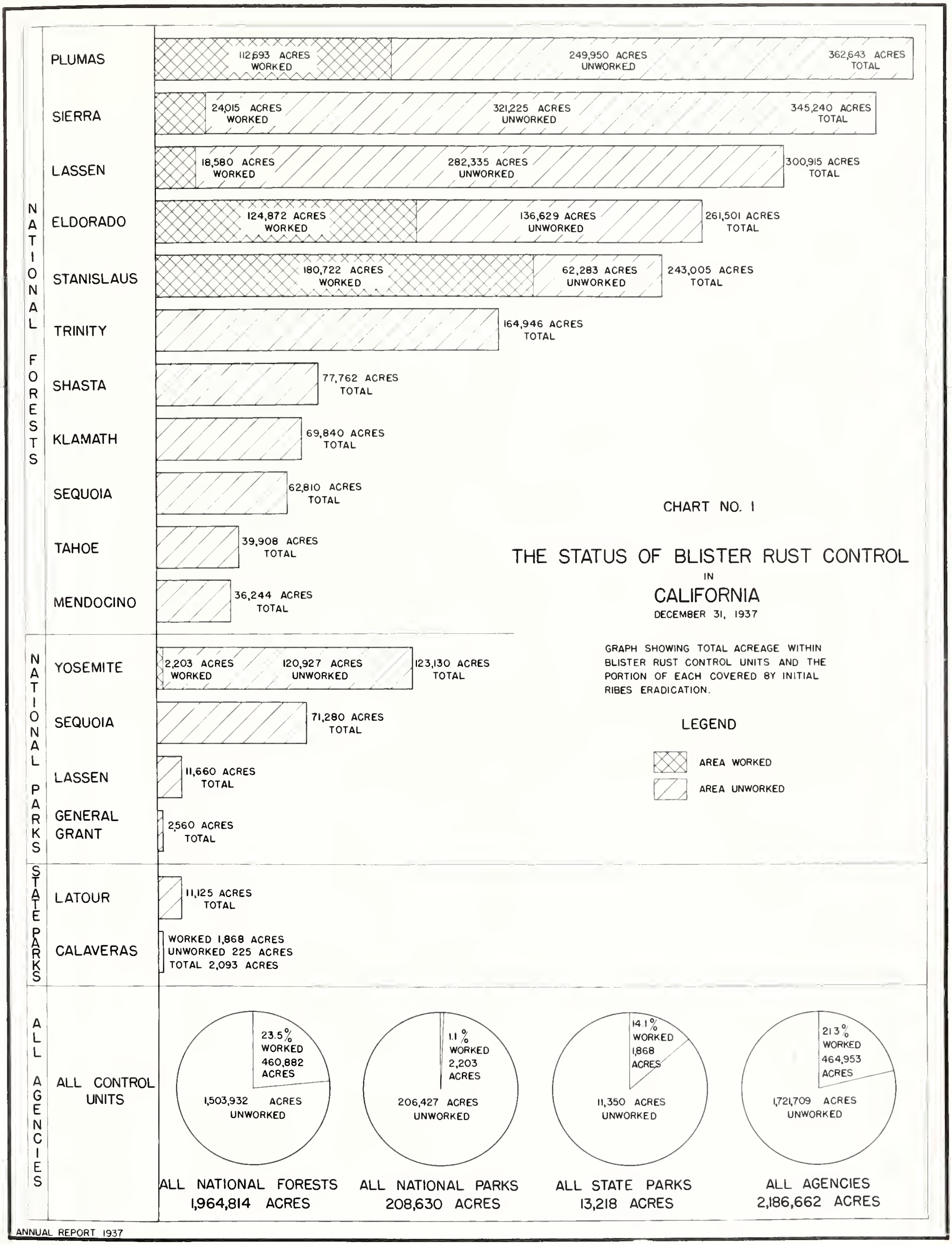
* Of the $2,842.27 worth of food from the previous year, $968.40 worth was sold to the Forest Service and the remainder was divided equally between the Eldorado and Stanislaus Operations. The string ($322.00 worth) was divided equally among the other three California operations.

** Food valued at $1,759.27 was sold to a CCC camp and has been deducted in the column headed "Non Eradication Charges"

TABLE NO. 6

MEAL COSTS FOR THE RIBES ERADICATION PROJECTS OF THE SUGAR PINE REGION, 1937

Agency	Item	Operation					Total Costs
		Plumas	Eldorado	Stanislaus	Sierra	Rogue River	
Bureau	Food	-	$22,286.03	$21,412.55	$10,457.25	$ 7,853.35	$ 62,009.18
	Kitchen help	-	5,214.40	4,137.34	2,363.10	2,719.55	14,434.39
	Transportation of food	-	818.10	729.42	350.00	707.61	2,605.13
	Total meal cost	-	28,318.53	26,279.31	13,170.35	11,280.51	79,048.70
	Less amount paid by men for meals	-	16,975.80	14,102.20	9,100.01	5,122.80	45,300.81
	Deficit	-	$11,342.73	$12,177.11	$ 4,070.34	$ 6,157.71	$ 33,747.89
	Total meals served	-	103,641	101,726	60,724	32,960	299,051
	Average cost per meal	-	.273	.258	.217	.342	.264
	Average deficit per meal	-	.109	.118	.067	.187	.113
Forest Service	Food	$3,400.94	$ 4,245.86	$ 3,883.96	$16,004.42	-	$ 27,535.18
	Kitchen help	912.02	1,064.20	963.80	5,079.92	-	8,019.94
	Transportation of food	174.62	272.70	243.14	714.71	-	1,405.17
	Total meal cost	4,487.58	5,582.76	5,090.90	21,799.05	-	36,960.29
	Less amount paid by men for meals	2,989.52	3,770.66	2,501.46	12,859.41	-	22,121.05
	Deficit	$1,498.06	$ 1,812.10	$ 2,589.44	$ 8,939.64	-	14,839.24
	Total meals served	19,692	21,750	15,354	77,541	-	134,337
	Average cost per meal	.228	.257	.332	.281	-	.275
	Average deficit per meal	.076	.083	.169	.115	-	.110
Total for Sugar Pine Region	Food	$3,400.94	$26,531.89	$25,296.51	$26,461.67	$ 7,853.35	$ 89,544.36
	Kitchen help	912.02	6,278.60	5,101.14	7,443.02	2,719.55	22,454.33
	Transportation of food	174.62	1,090.80	972.56	1,064.71	707.61	4,010.30
	Total meal cost	4,487.58	33,901.29	31,370.21	34,969.40	11,280.51	116,008.99
	Less amount paid by men for meals	2,989.52	20,746.46	16,603.66	21,959.42	5,122.80	67,421.86
	Deficit	$1,498.06	$13,154.83	$14,766.55	13,009.98	6,157.71	48,587.13
	Total meals served	19,692	125,391	117,080	138,265	32,960	433,388
	Average cost per meal	.228	.270	.268	.253	.342	.268
	Average deficit per meal	.076	.105	.126	.094	.187	.112


NATIONAL FORESTS
PLUMAS
112,693 ACRES WORKED
249,950 ACRES UNWORKED
362,643 ACRES TOTAL
SIERRA
24,015 ACRES WORKED
321,225 ACRES UNWORKED
345,240 ACRES TOTAL
LASSEN
18,580 ACRES WORKED
282,335 ACRES UNWORKED
300,915 ACRES TOTAL
ELDORADO
124,872 ACRES WORKED
136,629 ACRES UNWORKED
261,501 ACRES TOTAL
STANISLAUS
180,722 ACRES WORKED
62,283 ACRES UNWORKED
243,005 ACRES TOTAL
TRINITY
164,946 ACRES TOTAL
SHASTA
77,762 ACRES TOTAL
KLAMATH
69,840 ACRES TOTAL
SEQUOIA
62,810 ACRES TOTAL
TAHOE
39,908 ACRES TOTAL
MENDOCINO
36,244 ACRES TOTAL
NATIONAL PARKS
YOSEMITE
2,203 ACRES WORKED
120,927 ACRES UNWORKED
123,130 ACRES TOTAL
SEQUOIA
71,280 ACRES TOTAL
LASSEN
11,660 ACRES TOTAL
GENERAL GRANT
2,560 ACRES TOTAL
STATE PARKS
LATOUR
11,125 ACRES TOTAL
CALAVERAS
WORKED 1,868 ACRES
UNWORKED 225 ACRES
TOTAL 2,093 ACRES
ALL AGENCIES
ALL CONTROL UNITS
23.5% WORKED 460,882 ACRES
1,503,932 ACRES UNWORKED
ALL NATIONAL FORESTS 1,964,814 ACRES
1.1% WORKED 2,203 ACRES
206,427 ACRES UNWORKED
ALL NATIONAL PARKS 208,630 ACRES
14.1% WORKED 1,868 ACRES
11,350 ACRES UNWORKED
ALL STATE PARKS 13,218 ACRES
21.3% WORKED 464,953 ACRES
1,721,709 ACRES UNWORKED
ALL AGENCIES 2,186,662 ACRES
CHART NO. 1
THE STATUS OF BLISTER RUST CONTROL
IN
CALIFORNIA
DECEMBER 31, 1937
GRAPH SHOWING TOTAL ACREAGE WITHIN BLISTER RUST CONTROL UNITS AND THE PORTION OF EACH COVERED BY INITIAL RIBES ERADICATION.
LEGEND
AREA WORKED
AREA UNWORKED
ANNUAL REPORT 1937

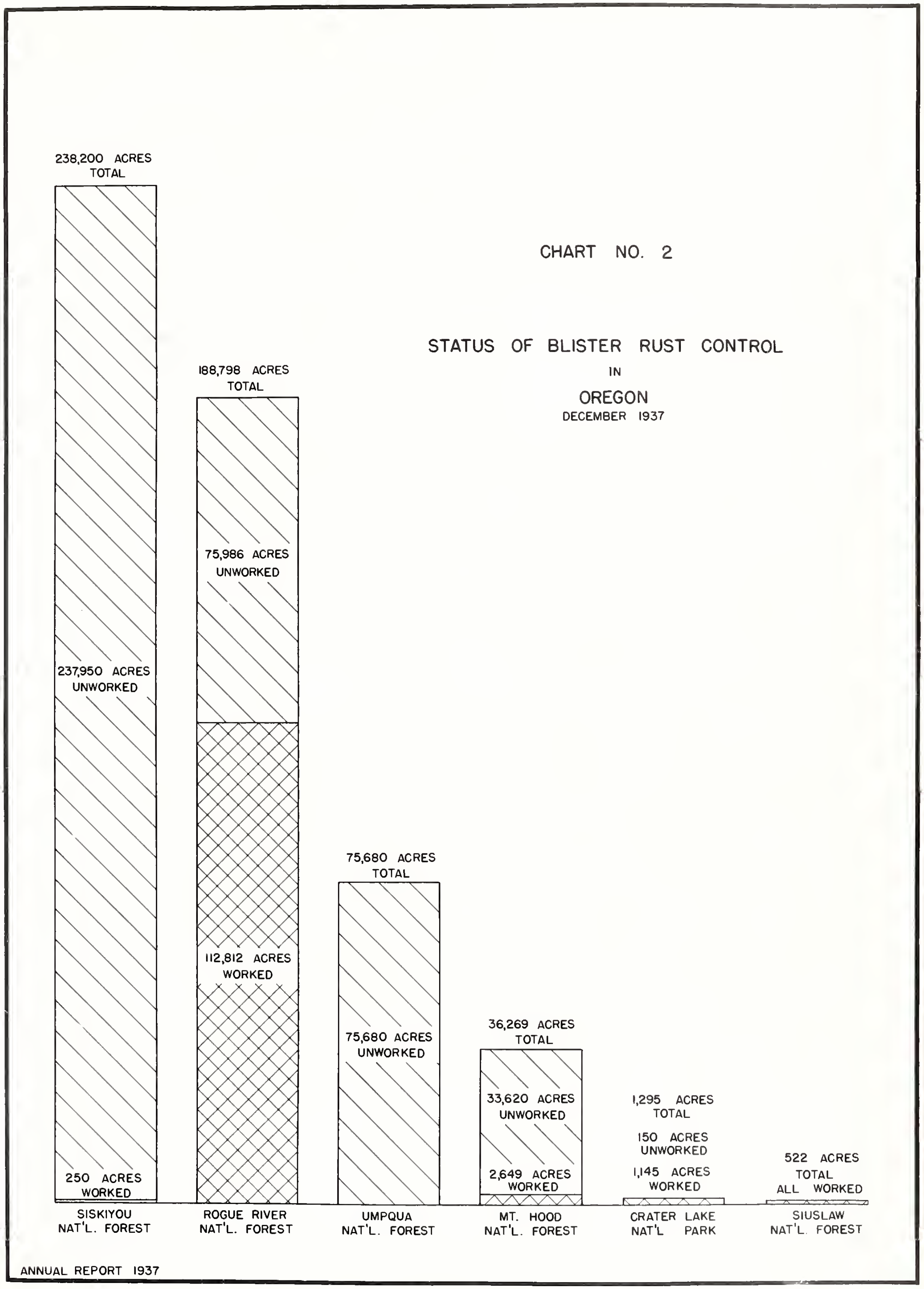


CHART NO. 2
STATUS OF BLISTER RUST CONTROL
IN
OREGON
DECEMBER 1937
238,200 ACRES
TOTAL
237,950 ACRES
UNWORKED
250 ACRES
WORKED
SISKIYOU
NAT'L. FOREST
188,798 ACRES
TOTAL
75,986 ACRES
UNWORKED
112,812 ACRES
WORKED
ROGUE RIVER
NAT'L. FOREST
75,680 ACRES
TOTAL
75,680 ACRES
UNWORKED
UMPQUA
NAT'L. FOREST
36,269 ACRES
TOTAL
33,620 ACRES
UNWORKED
2,649 ACRES
WORKED
MT. HOOD
NAT'L. FOREST
1,295 ACRES
TOTAL
150 ACRES
UNWORKED
1,145 ACRES
WORKED
CRATER LAKE
NAT'L PARK
522 ACRES
TOTAL
ALL WORKED
SIUSLAW
NAT'L. FOREST
ANNUAL REPORT 1937

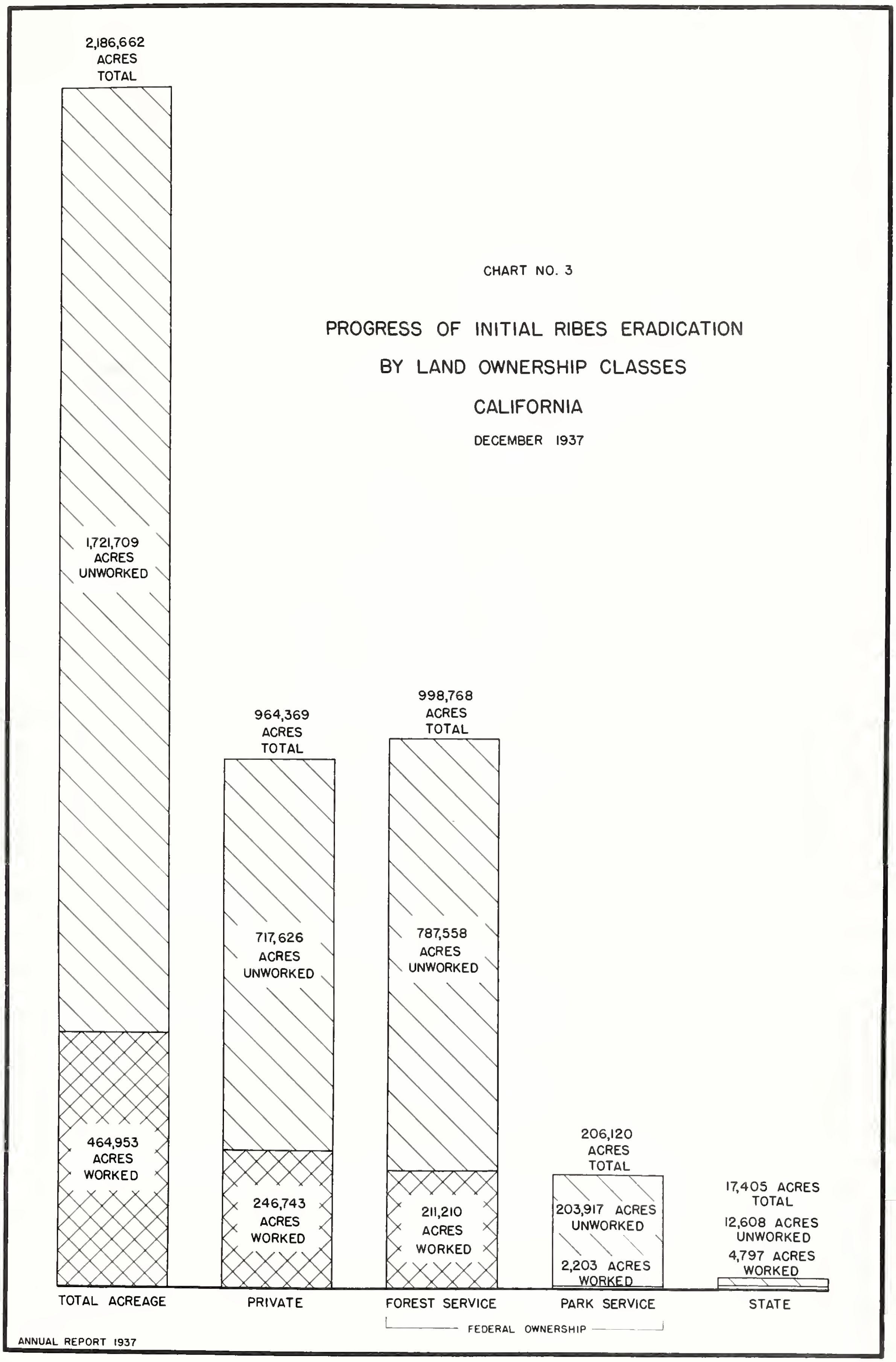


CHART NO. 3
PROGRESS OF INITIAL RIBES ERADICATION
BY LAND OWNERSHIP CLASSES
CALIFORNIA
DECEMBER 1937
2,186,662 ACRES TOTAL
1,721,709 ACRES UNWORKED
464,953 ACRES WORKED
964,369 ACRES TOTAL
717,626 ACRES UNWORKED
246,743 ACRES WORKED
998,768 ACRES TOTAL
787,558 ACRES UNWORKED
211,210 ACRES WORKED
206,120 ACRES TOTAL
203,917 ACRES UNWORKED
2,203 ACRES WORKED
17,405 ACRES TOTAL
12,608 ACRES UNWORKED
4,797 ACRES WORKED
TOTAL ACREAGE
PRIVATE
FOREST SERVICE
PARK SERVICE
STATE
FEDERAL OWNERSHIP
ANNUAL REPORT 1937

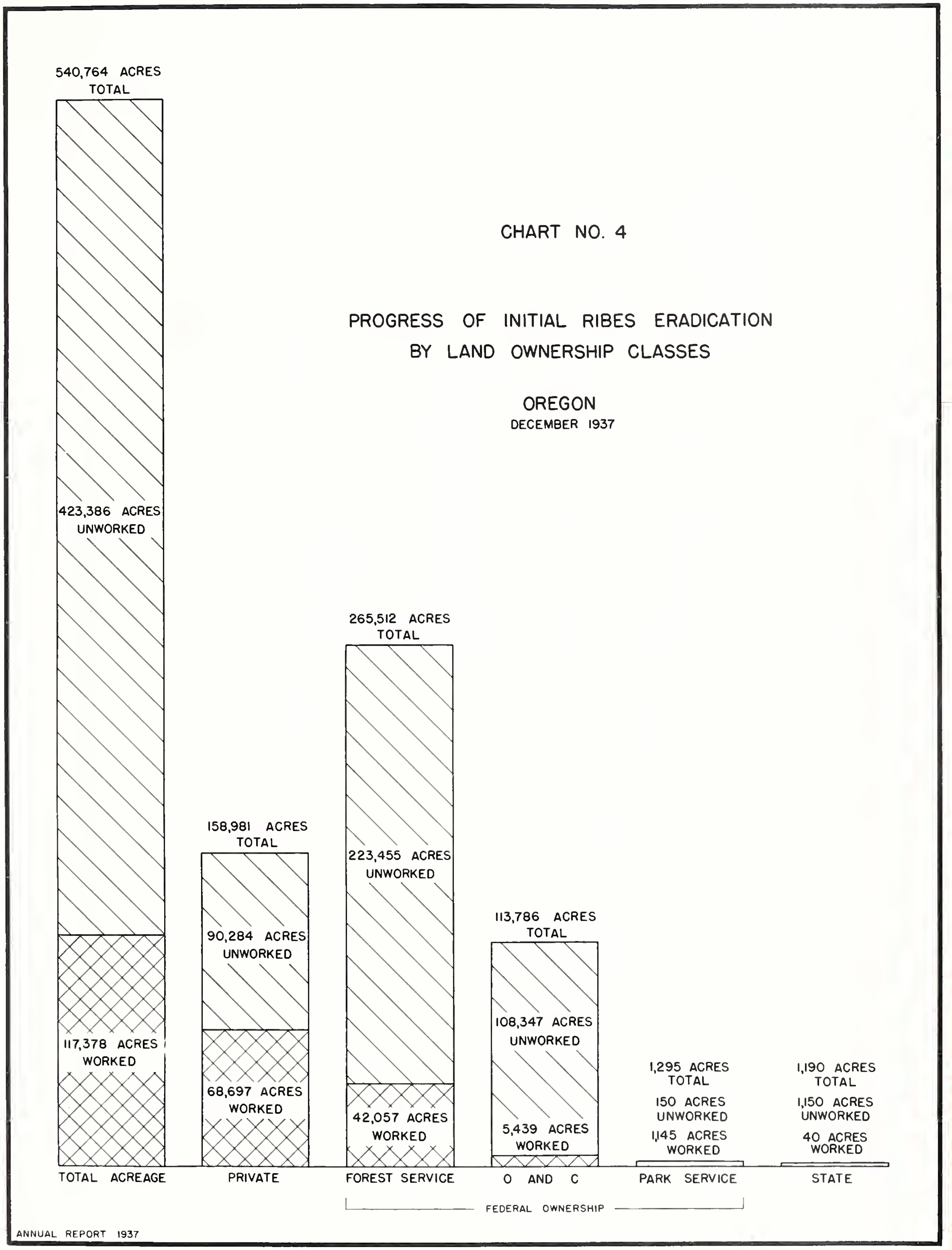


CHART NO. 4
PROGRESS OF INITIAL RIBES ERADICATION
BY LAND OWNERSHIP CLASSES
OREGON
DECEMBER 1937
540,764 ACRES TOTAL
423,386 ACRES UNWORKED
117,378 ACRES WORKED
158,981 ACRES TOTAL
90,284 ACRES UNWORKED
68,697 ACRES WORKED
265,512 ACRES TOTAL
223,455 ACRES UNWORKED
42,057 ACRES WORKED
113,786 ACRES TOTAL
108,347 ACRES UNWORKED
5,439 ACRES WORKED
1,295 ACRES TOTAL
150 ACRES UNWORKED
1,145 ACRES WORKED
1,190 ACRES TOTAL
1,150 ACRES UNWORKED
40 ACRES WORKED
TOTAL ACREAGE
PRIVATE
FOREST SERVICE
O AND C
PARK SERVICE
STATE
FEDERAL OWNERSHIP
ANNUAL REPORT 1937

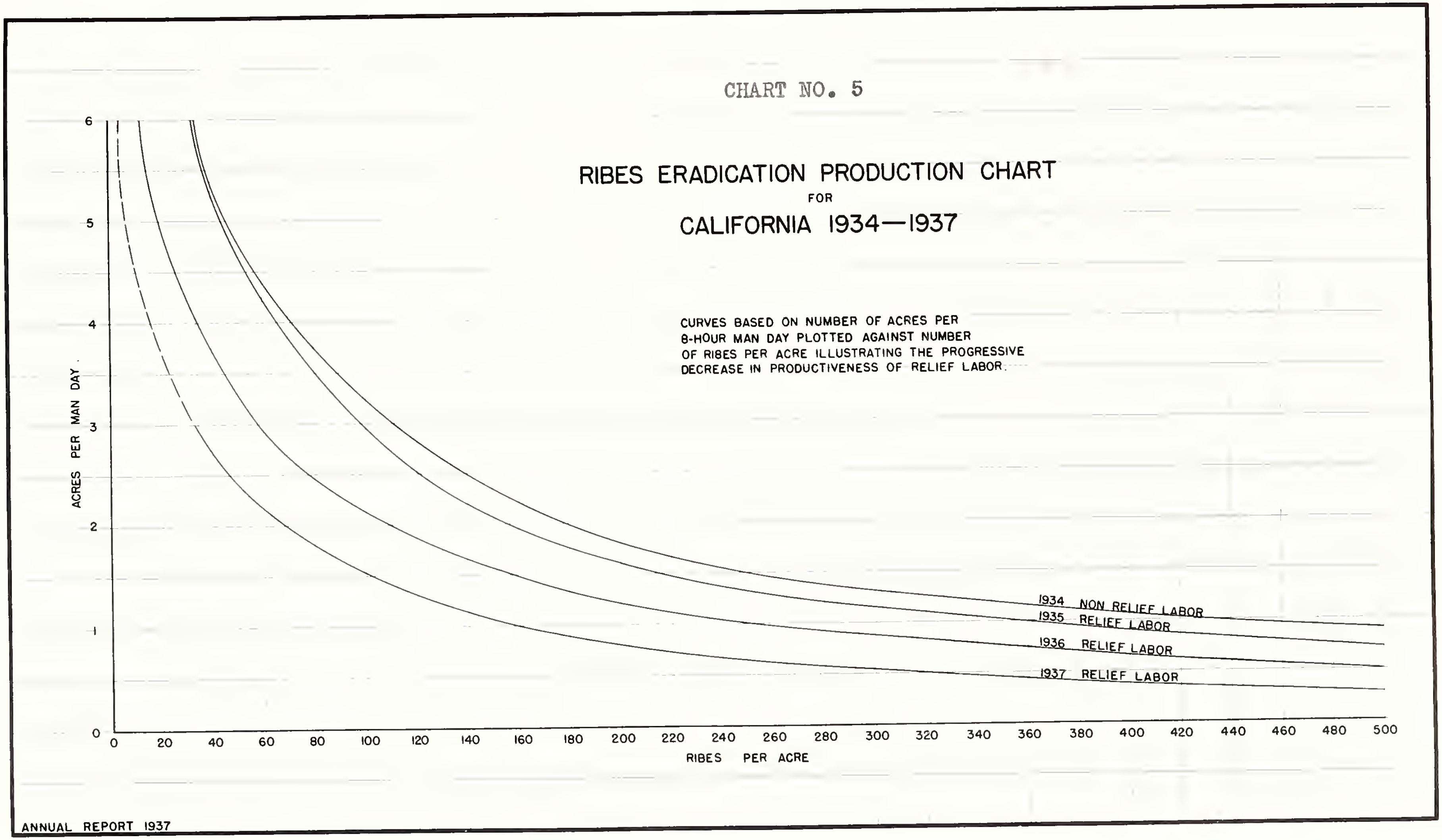


CHART NO. 5
RIBES ERADICATION PRODUCTION CHART
FOR
CALIFORNIA 1934—1937
CURVES BASED ON NUMBER OF ACRES PER
8-HOUR MAN DAY PLOTTED AGAINST NUMBER
OF RIBES PER ACRE ILLUSTRATING THE PROGRESSIVE
DECREASE IN PRODUCTIVENESS OF RELIEF LABOR.
1934 NON RELIEF LABOR
1935 RELIEF LABOR
1936 RELIEF LABOR
1937 RELIEF LABOR
ACRES PER MAN DAY
0
1
2
3
4
5
6
RIBES PER ACRE
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460
480
500
ANNUAL REPORT 1937

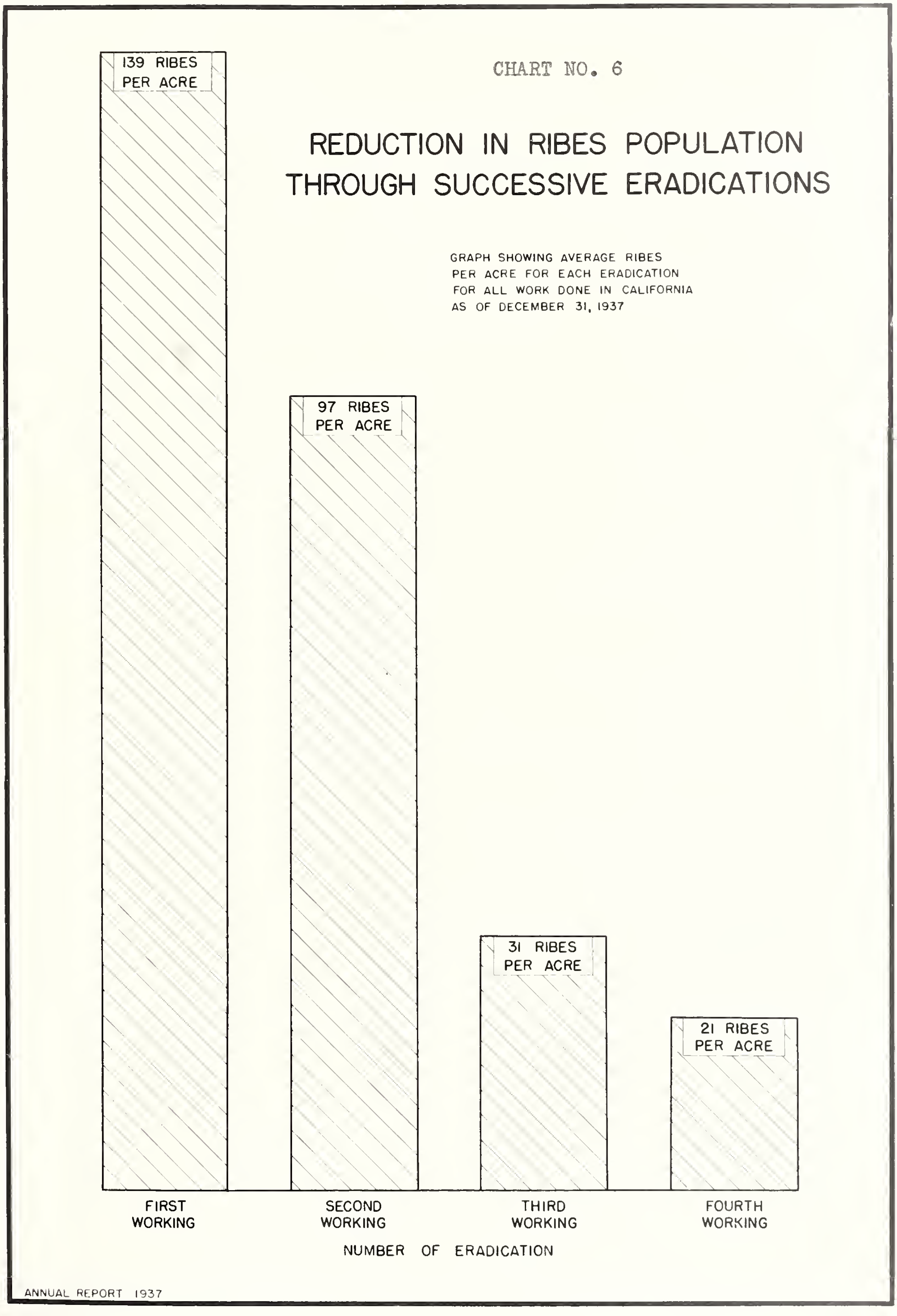


CHART NO. 6
REDUCTION IN RIBES POPULATION THROUGH SUCCESSIVE ERADICATIONS
GRAPH SHOWING AVERAGE RIBES PER ACRE FOR EACH ERADICATION FOR ALL WORK DONE IN CALIFORNIA AS OF DECEMBER 31, 1937
139 RIBES PER ACRE
97 RIBES PER ACRE
31 RIBES PER ACRE
21 RIBES PER ACRE
FIRST WORKING
SECOND WORKING
THIRD WORKING
FOURTH WORKING
NUMBER OF ERADICATION
ANNUAL REPORT 1937

PART III

CHECKING IN THE SUGAR PINE REGION

A. General Summary

By

T. H. Harris, Associate Forester

Although the definition and the objectives of the various classes of checking have often been stated, they are repeated here to make more intelligible the discussion and the summary tables that follow.

Checking is the systematic inspection of Ribes conditions on an area by strip sampling to obtain a reliable estimate of the distribution, the number, and the feet of live stem of Ribes on that area.

There are three general classes of checking:

Regular checking is the inspection of all areas worked by eradication crews. Its purpose is to indicate to what degree the standard of control has been reached. It is normally made a few days after Ribes eradication has been completed, and is never made later than the following season.

Advance checking is the inspection of areas before Ribes eradication in order to obtain information on the occurrence of Ribes, from which the most effective eradication can be planned. By means of an advance check those areas that are very low in Ribes population may often be eliminated from crew work.

Post checking is the inspection of areas two or more years following Ribes eradication for the purpose of determining the status of control.

The organization of the supervisory personnel, consisting of the regional checking supervisor and a checking supervisor on each of the five operations, remained unchanged from previous years. Except for a few refinements, the methods of work, which are fully explained in the checking manual, were the same as those employed in 1936.

CALIFORNIA

When the eradication operations expanded to full strength in early July, the most desirable applicants for checking work had already found employment elsewhere, so that it was extremely difficult to find men who were qualified for appointment. Several of those hired proved later to be unsatisfactory. Because of this scarcity of checker material, of inability to hire more men than the 95 to 5 ratio would allow, and of the desire to get some badly needed work done, some of the most promising "reliefers" were employed as checkers. Although a few of these performed satisfactory work, the majority, in spite of the most careful and laborious training by the checking supervisors, often turned out work that did not meet the accepted standards of accuracy. The majority of the personnel engaged in post checking on the Eldorado were security wage workers.

In view of the unfortunate experience in using "reliefers" and of the fundamental necessity of maintaining checking work at the highest attainable standard of accuracy, it is strongly recommended that security wage workers, except those of demonstrated ability, be not employed as checkers.

In order to keep the standards of checking work at the point of highest accuracy, the system of rerunning original strips by the checking supervisor in the company of the checker was practiced more diligently in 1937 than ever before. In the periodical inspections of the checking work of each operation by the regional checking supervisor, nearly all his time in the field was devoted to retracement of strips; such examinations gave him first-hand knowledge of the quality of the work being done.

As it was deemed that for the area post checked on the Eldorado, eight strips per section would yield the information desired, the percentage of check was uniformly 2.4 per cent; in the post check on the Stanislaus only as many strips were run as necessary, resulting in a 3.6 per cent check; on the Sierra sixteen strips per section were run, resulting in a 4.8 per cent check. In the post check, except on the Sierra, where an "X" was used to record the feet of live stem in areas of high Ribes concentration, the number of bushes and the feet of live stem in each one-chain transect were recorded.

The results of all classes of checking in California are given in Tables Nos. 1 to 5. Table No. 6 gives a classification of checking time, and an analysis of cost; the cost per checking man day was $5.50. Table No. 7 is an analysis of regular checking; it indicates that 27.6 per cent of the area receiving a first regular check, received also a recheck.

Table No. 7 shows also a difference among the operations in the per acre cost of regular checking based on all acres checked that requires closer inspection to determine the cause. The cost per acre for the Plumas, the Eldorado, and the Sierra is nearly 22 cents, whereas the cost for the Stanislaus is only 13 cents. Superficially it appears that the Stanislaus check cost less than the others, but the disparity may be explained in large part by consulting Table No. 1, which shows that the percentage of check on the Stanislaus was only 4.3 as against 6.2 for the Eldorado and the Sierra, and 5.5 for the Plumas (which has a relatively small proportion of the total acreage checked). Inasmuch as the cost per acre is directly proportional to the percentage of check, the variation, therefore, in the cost per acre of regular checking, may be largely ascribed to the difference in the percentage of check.

OREGON

Checking work in Oregon was directed by a checking supervisor who was under the general direction of the regional checking supervisor for the Sugar Pine Region. In order to meet the 95 to 5 ratio between reliefers and appointed personnel on the Oregon operation it was not possible to employ appointed checkers, as the positions were more direly needed for eradication overhead.

In order to post check the Prospect area, which was worked initially in 1934 and was scheduled for reeradication in 1937, a 10-man party, composed of reliefers who had been engaged in reconnaissance since the close of the 1936 season, was trained for checking at the beginning of the season. The entire area of 15,561 acres was post checked by July 1; 90 per cent of the area was blocked out as Ribes free. From July 1 to the close of work most of the checking was performed in the Upper Rogue control unit where 7,882 acres of 1935 eradication were post checked; regular and advance checking were also done.

During the season one checker was transferred to the Crater Lake National Park to advance check an area of 1,145 acres.

The use of reliefer checkers was not satisfactory; of 12 men employed during the season, six were dismissed or transferred to other work because of incompetence as checkers. The cost of checking increased 26 per cent and production decreased by a similar amount with no increase in accuracy to compensate.

The results of checking in Oregon are summarized in Tables Nos. 8 to 12.

POST CHECKING IN CALIFORNIA

During 1937, 51,638 acres were post checked, which was the first large-scale work of this kind performed in the Sugar Pine Region. Of particular significance was the work on the Eldorado operation where a post checking camp was established at Chicken Hawk Springs in the Silver Creek control unit, which had received initial Ribes eradication in 1934. Because the results lend themselves to some interesting conclusions, and because of the importance of this work in planning reeradication, the data gathered by the Eldorado post check are reported and analyzed separately under "B" of Part III.

The Stanislaus Operation

The area selected for the post check is known as the Dorrington unit, or the area in and around Dorrington and Camp Connell, Calaveras County. It was selected mainly for two reasons: (1) the checkers could work out of one of the regular blister rust camps, and (2) the area would probably be first in line for reeradicative work.

Initial Ribes eradication on the area was done in 1928, and the first reeradication in 1932; no further eradicative work has been performed since 1932. The original Ribes population was considered light. The entire unit is timber type except for several small areas which were logged forty or fifty years ago, so that the conditions caused by logging have almost reverted to those in a virgin stand. The ground cover as a whole is rather open with large areas of bear clover on the west slope of the North Fork of the Stanislaus River.

The method of performing the post check was to give the area a $2\frac{1}{2}$ per cent check first, spacing the strips 10 chains apart, and then if conditions warranted, to fill in the intervening strips. This accounts for the 3.6 per cent check as shown in Table No. 5. Some sections were given a full 5 per cent check, and others a straight $2\frac{1}{2}$ per cent.

The results of the post check show that approximately 50 per cent of the acreage may be blocked out. Mostly large, missed bushes were found, many growing in small, local concentrations. Very few seedlings were observed. If the next reeradication of Ribes be thoroughly done, a large percentage of the area should go on maintenance.

A small amount of post check was done on the Mokelumne Unit near Forest Creek on areas initially eradicated of Ribes in 1934. Only areas that originally supported from 25 feet of live stem to 30 bushes per acre were checked. An exception to this was several small areas of higher Ribes concentration that were checked as an experiment.

The Sierra Operation

The area post checked was a part of the northern Chowchilla unit which received initial Ribes eradication in 1935. This locality is generally ideal for Ribes growth, the greater part of it originally supporting a heavy concentration. The original distribution of Ribes was extremely variable; the present is even more so.

The purpose of the post check included several objectives. Because of rapid Ribes regeneration on parts of the area worked initially in 1935, it is imperative that some reeradication be done in 1938, for which a post check would enable the preparation of a working plan. It is desirable to locate and define boundaries of areas of extreme Ribes density that can be most economically worked by oiling, if that method is demonstrated to be effective when the survival on the trial plots is determined early in 1938. A sample was desired of the 1935 check in order to determine the reliability of the checking that was done late in the season, and before the present standards of accuracy were attained. This post check was also intended to serve to plan future post checks on the Sierra operation, to indicate the cost, and to provide information as to the methods of how best to perform the work. An attempt was made to record separately old, missed bushes and sprouts which were probably fruiting, and the young (one and two year old) bushes.

The methods used to obtain the post check were as described in the checking manual for the advance check. On the maps the fruiting bushes, missed bushes, and sprouts were plotted by 5-chain transects in parentheses; the young bushes were plotted as usual by 5-chain transects. It was not considered necessary to note the current season's seedlings since any area having young bushes would also have seedlings; conversely if no young bushes were present it was assumed no seedlings would be present. The Ribes found as the strips crossed stream type were plotted in blue near the stream crossing concerned. The strips were spaced at 5-chain intervals because of the extremely variable Ribes conditions.

The results of this post check are shown graphically on a map in the files of the Oakland office and are summarized in Table No. 5. The check was considered as a 4.8 per cent check of 1,770 acres. Of this area all was cutover type except 160 acres of timber type. One hundred acres of the timber type is Ribes free. All the remaining 1,670 acres will require work by crews, although it appears that numerous scattered sites of ten acres or less are Ribes free.

A total of 112 acres of the 1,770 post checked, on the basis of the per acre results by 5-chain transects, appear to support over 1,000 established Ribes plants per acre. These 112 acres are made up of small areas, the largest of which is not greater than a 10-acre square, and the smallest is $2\frac{1}{2}$ acres. These small areas exceeding 1,000 Ribes per acre very largely coincide with the area that can be effectively handled only by some special eradication method. Roads pass through or within one-fourth mile of these heavy areas.

The distinction between young and old bushes found by the post check permits some striking comparisons. Forty acres contained 64 old bushes (missed on initial eradication or sprouts) totaling 379 feet of live stem per acre, but only 1.5 young bushes totaling 2 feet of live stem per acre. On this dry area, Ribes are in an almost static condition; the plants are small in size and lose their leaves early. The area was necessarily worked late in 1935, and although it did not all meet the standard, rework was not done at that time because of the lateness of the season. The final check of these 40 acres in 1935 gave these per acre results: bushes, 2.5; feet of live stem, 20. This check was not reliable, probably as a result of having been made after the middle of October. A good re-eradication on areas of this type should result in four year maintenance.

It may seem from a comparison of the results from these 40 acres, that possibly 61 Ribes sprouted per acre. Probably this is not true; it is more likely that the check was poor because it was made after the middle of October on an exposed and poor Ribes site where the bushes become defoliated early. It should also be pointed out that the individual checker may have been at fault because the final check of the next 40-chain strip, only 4 chains to the north, gave 46 bushes and 406 feet of live stem per acre which corresponds closely to the post check figures for old bushes.

Opposed to the area just described is another of eighty acres which supported at the time of the post check 1.7 old bushes and sprouts totaling 16 feet of live stem per acre, and 639 young bushes totaling about 1,000 feet of live stem per acre. On this area the final check after eradication showed 0.5 bushes and one foot of live stem per acre. The following data and table indicating the progress of eradication on this area should be of interest: Ribes per acre according to adjusted reconnaissance data of 1934 - 2,200; original concentration of Ribes per acre based on crew's report of Ribes removed - 2,320.

Results of checks (per acre)

Type of check	Bushes	Feet of Live Stem
First, Regular	6.4	110
Second, "	2.4	30
Third, "	3.7	68
Fourth, "	2.3	27
Fifth, " (final)	.5	1
Post, (old bushes only	1.7	16
(young bushes	639	1,000 (estimate)

On this area the eradication job must have been excellent. It is apparent that the regular check was fairly accurate. It seems that sprouting was very low considering the enormous original population of Ribes. At the end of the first regular check it is evident that 99-3/4 per cent of the Ribes had been removed from the area. It was not until the completion of the fifth check that the area met the twenty-five foot of live stem standard and at that time it appeared that the Ribes had been almost entirely removed.

By use of the post check maps and other data it should be possible to plan an effective reeradication for the northern Chowchilla unit.

W-1723 - CAMP #4 ON THE SIERRA NATIONAL FOREST, CALIFORNIA.

W-1655 - A TYPICAL BLISTER RUST CAMP HOUSING 75 MEN. NOTE THE MESS HALL AT THE LOWER LEFT. (OREGON)

W-2259 - THE BUSINESS END OF A MESS HALL - THE KITCHEN OF A BLISTER RUST CAMP. NORMAL FEEDING CAPACITY 150 MEN.

W-1697 - THE RECEIVING END - 150 MEN AT MESS IN A BLISTER RUST CAMP.

TABLE NO. 1

RESULTS OF REGULAR CHECKING IN CALIFORNIA DURING 1937*

National Forest	Eradication Type	Acres Covered by Eradication	Acres Covered by Check	Acres in Check Strips	Per Cent of Check	Man Days	Areas Averaging Less Than 25 FLS Per Acre			Areas Averaging More Than 25 FLS Per Acre			Acres Un-checked
							Acres	Ribes per Acre Bushes	Ribes per Acre F.L.S.	Acres	Ribes per Acre Bushes	Ribes per Acre F.L.S.	
Plumas	Timber	3,479	3,161	158.5	5.0	96 6/8	2,725	2.5	6.4	436	18.4	66.6	318
	Stream	70	71	19.1	26.9	12 1/8	54	5.1	10.1	17	35.4	102.0	
	All Types	3,549	3,232	177.6	5.5	108 7/8	2,779	2.8	6.8	453	21.1	72.1	318
Eldorado	Timber	7,459	7,459	409.4	5.5	219 2/8	7,221	3.4	7.1	238	16.5	32.7	
	Cut Over	2,050	2,050	123.3	6.0	71 1/8	1,869	3.1	9.3	181	13.7	39.3	
	Brush	843	843	41.5	4.9	30 5/8	781	2.7	8.1	62	22.3	63.1	
	Stream	293	293	83.8	28.6	45 6/8	266	3.5	5.9	27	26.7	61.9	
	All Types	10,645	10,645	658.0	6.2	366 6/8	10,137	3.3	7.4	508	17.6	42.2	
Stanislaus	Timber	7,737	13,325	575.6	4.3	243 6/8	7,710	1.9	4.8	5,615	9.1	53.9	1,254
	Cut Over	6,840	7,312	293.6	4.0	152 6/8	3,794	2.8	6.0	3,518	13.8	64.5	1,514
	Brush	224	25	0.7	2.8	4/8				25	2.9	58.6	199
	Stream	354	91	14.9	16.4	3 7/8	87	4.3	9.9	4	19.1	40.0	319
	All Types	15,155	20,753	884.8	4.3	400 7/8	11,591	2.2	5.3	9,162	10.9	57.8	3,286
Sierra	Timber	5,278	5,552	287.2	5.2	132 6/8	5,314	2.5	7.2	238	8.7	41.7	
	Cut Over	2,038	2,093	114.2	5.5	63 4/8	1,742	4.9	13.9	351	9.0	41.9	5
	Stream	222	225	82.8	36.8	41 6/8	181	5.9	10.0	44	19.8	56.8	
	All Types	7,538	7,870	484.2	6.2	238	7,237	3.5	9.1	633	12.9	47.3	5
Grand Totals	Timber	23,953	29,497	1,430.7	4.9	692 4/8	22,970	2.6	6.3	6,527	10.3	53.3	1,572
	Cut Over	10,928	11,455	531.1	4.6	287 3/8	7,405	3.4	8.9	4,050	13.2	60.0	1,519
	Brush	1,067	868	42.2	4.9	31 1/8	781	2.7	8.1	87	19.8	62.5	199
	Stream	939	680	200.6	29.5	103 4/8	588	4.6	8.1	92	22.9	63.6	319
	All Types	36,887	** 42,500	2,204.6	5.2	1,114 4/8	31,744	3.0	7.1	10,756	12.2	56.4	3,609

* Includes checking done by the Bureau of Entomology and Plant Quarantine and the Forest Service.

** 9222 acres worked in 1936 were checked in 1937.

TABLE NO. 2

SUMMARY OF RESULTS OF REGULAR CHECKING ACCORDING TO AGENCY INVOLVED CALIFORNIA, 1937

National Forest	Agency	Acres Covered by Eradication	Acres Covered by Check	Acres in Check Strips	Per Cent of Check	Man Days	Areas Averaging Less Than 25 FLS Per Acre: Acres	Ribes Per Acre: Bushes	Ribes Per Acre: F.L.S.	Areas Averaging More Than 25 FLS Per Acre: Acres	Ribes Per Acre: Bushes	Ribes Per Acre: F.L.S.	Acres Un-checked
Plumas	Forest Service	3,549	3,232	177.6	5.5	108 7/8	2,779	2.8	5.8	453	21.1	72.1	318
Eldorado	Bureau	7,497	7,497	471.6	6.2	280 4/8	6,989	3.3	7.6	508	17.6	42.2	
	Forest Service	3,148	3,148	186.4	5.9	86 2/8	3,148	3.4	6.8				
	Total	10,645	10,645	658.0	6.2	366 6/8	10,137	3.3	7.4	508	17.6	42.2	
Stanislaus	Bureau	12,525	17,176	726.7	4.2	320 2/8	9,607	2.2	5.2	7,569	11.1	58.7	2,641
	Forest Service	2,630	3,577	158.1	4.4	80 5/8	1,984	2.1	5.6	1,593	10.0	53.7	645
	Total	15,155	20,753	884.8	4.3	400 7/8	11,591	2.2	5.3	9,162	10.9	57.8	3,286
Sierra	Bureau	4,640	4,977	296.8	6.0	130 6/8	4,641	2.7	7.3	336	12.9	54.7	
	Forest Service	2,898	2,893	187.4	6.5	107 2/8	2,596	4.8	12.1	297	13.0	40.5	5
	Total	7,538	7,870	484.2	6.2	238	7,237	3.5	9.1	633	12.9	47.3	5
Grand Totals	Bureau	24,662	29,650	1,495.1	5.0	731 4/8	21,237	2.8	6.6	8,413	11.8	56.9	2,641
	Forest Service	12,225	12,850	709.5	5.5	383	10,507	3.4	8.1	2,343	13.1	54.8	968
	Total	36,887	42,500	2,204.6	5.2	1,114 4/8	31,744	3.0	7.1	10,756	12.2	56.4	3,609

TABLE NO. 3

RESULT OF ADVANCE CHECKING IN CALIFORNIA DURING 1937*

National Forest	Eradi-cation Type	Acres Covered by Advance Check	Man Days	Areas Blocked Out: Acres	Acres in Check Strips	Per Cent of Check	Ribes Per Acre: Bushes	F.L.S.
Plumas	Timber	1,709	32	717	37.4	5.2	0.1	0.6
Eldorado	Timber	1,430	20 4/8	696	34.6	5.0	0.3	1.7
	Cut Over	32	6/8					
	Brush	6	2/8					
	All Types	1,468	21 4/8	696	34.6	5.0	0.3	1.7
Stanislaus	Cut Over	86	2					
	Brush	46	1					
	All Types	132	3					
Sierra	Timber	720	22 1/8	424	29.5	7.0	0.8	5.0
	Cut Over	50	6/8	15	.8	5.3	0.0	0.0
	All Types	770	22 7/8	439	30.3	6.9	0.8	4.9
Grand Totals	Timber	3,859	74 5/8	1,837	101.5	5.5	0.4	2.2
	Cut Over	168	3 4/8	15	.8	5.3	0.0	0.0
	Brush	52	1 2/8					
	All Types	4,079	79 3/8	1,852	102.3	5.5	0.4	2.2

* Includes checking done by the Bureau of Entomology and Plant Quarantine and the Forest Service.

TABLE NO. 4

SUMMARY OF RESULTS OF ADVANCE CHECKING ACCORDING TO AGENCY INVOLVED, CALIFORNIA, 1937

National Forest	Agency	Acres Covered by Advance Check	Man Days	Areas Blocked Out: Acres	Areas Blocked Out: Acres in Check Strips	Areas Blocked Out: Per Cent of Check	Ribes Per Acre: Bushes	Ribes Per Acre: F.L.S.
Plumas	Forest Service	1,709	32	717	37.4	5.2	0.1	0.6
Eldorado	Bureau	508	8 4/8	356	17.9	5.0	0.2	1.8
	Forest Service	960	13	340	16.7	4.9	0.5	1.6
	Total	1,468	21 4/8	696	34.6	5.0	0.3	1.7
Stanislaus	Bureau	132	3					
Sierra	Forest Service	770	22 7/8	439	30.3	6.9	0.8	4.9
Grand Totals	Bureau	640	11 4/8	356	17.9	5.0	0.2	1.8
	Forest Service	3,439	67 7/8	1,496	84.4	5.6	0.4	2.3
	Total	4,079	79 3/8	1,852	102.3	5.5	0.4	2.2

TABLE NO. 5

SUMMARY OF RESULTS OF POST CHECKING IN CALIFORNIA DURING 1937*

National Forest	Eradication Type	Acres Covered by Post Check	Man Days on Check Strips	Strip Acres	Per Cent of Check	Ribes Per Acre Bushes	Ribes Per Acre F. L. S.
Eldorado	Timber	17,235	173	418.3	2.4	21.6	78.4
	Cut Over	438	5 4/8	11.6	2.6	34.1	324.1
	Brush	298	5 6/8	6.9	2.3	39.1	186.1
	All Types	17,971	184 2/8	436.8	2.4	22.2	86.6
Stanislaus	Timber	8,454	94	301.6	3.6	4.8	41.3
Sierra	Timber	160	2 5/8	8.0	5.0	5.5	48.3
	Cut Over	1,610	37 4/8	76.7	4.8	249.4	554.4
	All Types	1,770	40 1/8	84.7	4.8	226.4	506.6
Grand Totals	Timber	25,849	269 5/8	727.9	2.8	14.5	62.7
	Cut Over	2,048	43	88.3	4.3	221.1	524.2
	Brush	298	5 6/8	6.9	2.3	39.1	186.1
	All Types	28,195	318 3/8	823.1	2.9	36.8	113.2

*Post checking done only by the Bureau of Entomology and Plant Quarantine during 1937.

TABLE NO. 6

COST OF CHECKING AND CLASSIFICATION OF CHECKING TIME, CALIFORNIA, 1937. BUREAU AND FOREST SERVICE

National Forest	Item	Man Days: Number	Man Days: Per Cent of Total	Acres Per Man Day (Basis of Total Acres Checked)*: Basis Man Days on Strips	Acres Per Man Day (Basis of Total Acres Checked)*: Basis All Man Days	Total Cost (Dollars)	Cost Per Acre: Basis of Total Acres Checked	Cost Per Acre: Basis of Acreage Covered by Eradication
Plumas	Regular Checking	173 1/8	56.9	41.9	26.3	$ 997.99	$ .219	$ .309
	Advance Checking	50 1/8	16.5	53.4	34.1	288.95	.169	.403
	All Checking	223 2/8	73.4	44.5	28.1	1,286.94	.205	.326
	Eradication	20 2/8	6.6			116.73		
	Fire	61	20.0			351.63		
	Totals	304 4/8	100.0			1,755.30		
Eldorado	Regular Checking	365 7/8	59.4	40.0	25.9	3,045.10	.208	.286
	Advance Checking	30 1/8	3.2	68.3	48.7	189.63	.129	.272
	Post Checking	301	31.6	97.5	59.7	1,470.27	.082	
	All Checking	897	94.2	59.6	38.0	4,705.00	.138	
	Eradication	36 5/8	3.9			212.88		
	Fire	18 2/8	1.9			123.78		
	Totals	951 7/8	100.0			5,041.66		
Stanislaus	Regular Checking	582 6/8	79.8	64.1	44.1	3,282.93	.128	.158
	Advance Checking	4 2/8	0.6	44.0	31.1	23.62	.179	
	Post Checking	135 6/8	18.6	89.9	63.0	755.16	.089	
	All Checking	722 6/8	99.0	68.9	47.4	4,061.71	.118	
	Eradication	7	1.0			38.92		
	Totals	729 6/8	100.0			4,100.63		
Sierra	Regular Checking	369 2/8	63.9	39.5	25.5	2,094.42	.223	.266
	Advance Checking	35 4/8	6.1	33.7	21.7	221.64	.288	.505
	Post Checking	62 2/8	10.8	44.1	28.4	323.87	.183	
	All Checking	467	80.8	39.7	25.4	2,639.93	.221	
	Eradication	111	19.2			638.25		
	Totals	578	100.0			3,278.18		
Grand Totals	Regular Checking	1,691	65.9	48.7	32.1	9,420.44	.173	.222
	Advance Checking	120	4.7	51.4	34.0	723.84	.177	.391
	Post Checking	499	19.5	88.6	56.5	2,549.30	.090	
	All Checking	2,310	90.1	57.3	37.5	12,693.58	.147	
	Eradication	174 7/8	6.8			1,006.78		
	Fire	79 2/8	3.1			475.41		
	Totals	2,564 1/8	100.0			14,175.77		

* Includes acreage covered by first check and all rechecks.

TABLE NO. 7

ANALYSIS OF REGULAR CHECKING IN CALIFORNIA, 1937
BUREAU AND FOREST SERVICE

National Forest	Eradication Type	Number of Check: First: Man Days	First: Acres	First: Total Cost (Dollars)	First: Cost Per Acre	Recheck: Man Days	Recheck: Acres	Recheck: Total Cost (Dollars)	Recheck: Cost Per Acre	All: Man Days	All: Acres	All: Total Cost (Dollars)	All: Cost Per Acre
Plumas	Timber	111 5/8	3,161	643.46	$.20	42 4/8	1,270	244.99	$.19	154 1/8	4,431	888.45	$.20
	Stream	10 6/8	71	61.97	.87	8 2/8	59	47.57	.81	19	130	109.54	.84
	All Types	122 3/8	3,232	705.43	.22	50 6/8	1,329	292.56	.22	173 1/8	4,561	997.99	.22
Eldorado	Timber	240 1/8	7,459	1,319.32	.18	92 3/8	2,770	522.45	.19	332 4/8	10,229	1,841.77	.18
	Cut Over	80 5/8	2,050	433.03	.21	29 1/8	806	156.64	.19	109 6/8	2,856	589.67	.21
	Brush	35 4/8	843	173.40	.21	14 4/8	274	70.83	.26	50	1,117	244.23	.22
	Stream	52 3/8	293	265.63	.91	21 2/8	165	103.80	.63	73 5/8	458	369.43	.81
	All Types	408 5/8	10,645	2,191.38	.21	157 2/8	4,015	853.72	.21	565 7/8	14,660	3,045.10	.21
Stanislaus	Timber	304	13,725	1,729.26	.13	51 4/8	2,392	288.84	.12	355 4/8	16,117	2,018.10	.13
	Cut Over	162 7/8	7,312	906.07	.12	57 7/8	2,142	321.96	.15	220 6/8	9,454	1,228.03	.13
	Brush	7/8	25	4.87	.19					7/8	25	4.87	.19
	Stream	4 7/8	91	27.50	.30	6/8	15	4.43	.30	5 5/8	106	31.93	.30
	All Types	472 5/8	21,153	2,667.70	.13	110 1/8	4,549	615.23	.14	582 6/8	25,702	3,282.93	.13
Sierra	Timber	175 4/8	5,228	954.32	.18	30 4/8	935	158.86	.17	206	6,163	1,113.18	.18
	Cut Over	63 6/8	2,078	392.91	.19	34 5/8	880	212.93	.24	98 3/8	2,958	605.84	.20
	Stream	52 2/8	225	303.21	1.35	12 5/8	57	72.19	1.27	64 7/8	282	375.40	1.33
	All Types	291 4/8	7,531	1,650.44	.22	77 6/8	1,872	443.98	.24	369 2/8	9,403	2,094.42	.22
Grand Totals	Timber	831 2/8	29,573	4,646.36	.16	216 7/8	7,367	1,215.14	.16	1,048 1/8	36,940	5,861.50	.16
	Cut Over	307 2/8	11,440	1,732.01	.15	121 5/8	3,828	691.53	.18	428 7/8	15,268	2,423.54	.16
	Brush	36 3/8	868	178.27	.21	14 4/8	274	70.33	.26	50 7/8	1,142	249.10	.22
	Stream	120 2/8	680	658.31	.97	42 7/8	296	227.99	.77	163 1/8	976	886.30	.91
	All Types	1,295 1/8	42,561	7,214.95	$.17	395 7/8	11,765	2,205.49	$.19	1,691	54,326	9,420.44	$.17

TABLE NO. 8

SUMMARY OF RESULTS OF REGULAR CHECKING IN OREGON, 1937

Eradication Type	Acres Covered By Eradication	Acres Covered By Check	Acres In Check Strips	Per Cent Of Check	Man Days	Areas Averaging Less Than 25 F.L.S. Per Acre			Areas Averaging More Than 25 F.L.S. Per Acre		
							Ribes Per Acre			Ribes Per Acre	
						Acres	Bushes	F.L.S.	Acres	Bushes	F.L.S.
Timber	4,077	*4,187	227.5	5.5	87 1/8	3,418	1.6	4.3	769	13.6 +	81.9 +
Cut Over	563	563	43.1	7.6	20 2/8	498	0.4	2.0	65	13.4	162.6
Brush	33	33	1.2	4.0	4/8	33	0.8	3.3			
Stream	2,224	2,164	258.3	11.9	37 6/8	1,446	3.2	7.0	718	18.8	77.1
All Types	6,897	6,947	530.1	7.6	195 5/8	5,395	2.2	5.2	1,552	17.1 +	80.8 +

* 110 acres worked in 1936 and checked in 1937

TABLE NO. 9

SUMMARY OF RESULTS OF ADVANCE CHECKING IN OREGON, 1937

Eradication Type	Acres Covered By Advance Check	Man Days	Areas Blocked Out				
			Acres	Acres In Check Strips	Per Cent Of Check	Ribes Per Acre	
						Bushes	F.L.S.
Timber	4,849	61 2/8	1,918	102.9	5.4	0.1	0.5
Cut Over	563	8 1/8	148	10.9	7.4	0.3	1.5
Stream	288	3 7/8					
All Types	5,700	73 2/8	2,066	113.8	5.5	0.1	0.6

TABLE NO. 10

SUMMARY OF RESULTS OF POST CHECKING IN OREGON, 1937

Eradication Type	Acres Covered By Post Check	Man Days on Check Strips	Strip Acres	Per Cent of Check	Ribes Per Acre	
					Bushes	F.L.S.
Timber	16,845	197 3/8	357.0	5.1	1.8	16.1
Cut Over	3,311	38 5/8	166.7	5.0	0.6	17.1
Brush	84	2 4/8	5.5	6.5	6.7	83.4
Stream	3,203	67 4/8	205.0	6.3	10.6	114.5
All Types	23,443	306	1234.2	5.3	3.1	32.9

TABLE NO. 11

COST OF CHECKING AND CLASSIFICATION OF CHECKING TIME, OREGON, 1937

Item	Man Days		Acres Per Man Day * (Basis of Total Acres Checked)		Total Cost (Dollars)	Cost Per Acre	
	Number	Per Cent of Total	Basis Man Days on Strips	Basis All Man Days		Basis of Total Acres Checked	Basis of Acreage Covered by Eradication
Regular Checking	229 1/8	32.8	44.2	36.1	1,245.73	$ .151	$ .181
Advance Checking	82 4/8	11.8	82.6	69.1	448.54	.078	.391
Post Checking	357 4/8	51.2	80.0	65.6	1,943.69	.083	
All Checking	669 1/8	95.8	68.1	55.9	3,637.96	.097	
Eradication	13 5/8	2.0			74.08		
Fire	15 5/8	2.2			84.95		
Totals	698 3/8	100.0			3,796.99		

* Includes acres covered by first check and all rechecks.

Note: Included in total cost is $100.40 paid by Park Service for checking in Crater Lake National Park.

TABLE NO. 12

ANALYSIS OF REGULAR CHECKING IN OREGON, 1937

Eradication Type	Number of Check											
	First				Recheck				All			
	Man Days	Acres	Total Cost	Cost Per Acre	Man Days	Acres	Total Cost	Cost Per Acre	Man Days	Acres	Total Cost	Cost Per Acre
Timber	88 6/8	4,187	$ 482.53	$.12	13 2/8	654	$ 72.04	$.11	102	4,841	$ 554.57	$.12
Cut Over	14	563	76.11	.14	9 6/8	268	53.01	.20	23 6/8	831	129.12	.16
Brush	4/8	33	2.72	.08	1/8	9	.68	.08	5/8	42	3.40	.08
Stream	89 6/8	2,164	487.96	.23	13	389	70.68	.18	102 6/8	2,553	558.64	.22
All Types	193	6,947	$1049.32	$.15	36 1/8	1,320	$ 196.41	$.15	229 1/8	8,267	$1245.73	$.15

W-988 - RIBES ROEZLI: - DISTRIBUTION GENERAL THROUGHOUT SUGAR PINE TYPE. FOUND ON ALL SITES. NOTE ABUNDANT FRUITING HABIT OF THIS SPECIES.

W-2181 - RIBES NEVADENSE: - GENERALLY DISTRIBUTED THROUGHOUT THE SIERRA NEVADA. USUALLY FOUND ALONG STREAMS AND ON MOIST NORTH SLOPES.

B. Analysis of the Results of Post Checking on the Eldorado National Forest, 1937

By

J. C. Crowell, Agent

Purpose of this Report

Primarily this report will be an analysis of the data taken during the operation of a post checking camp on the Eldorado operation during 1937 and will deal with methods employed, work performed, and results obtained. In the belief that the experience gained may be of practical value in analyzing present general practices in blister rust control, a discussion of results and recommendations for future work will be presented.

Location of Work

The check was performed on part of the Silver Creek unit, which is in the drainage basin of the South Fork of the American River in Eldorado County. The unit received initial Ribes eradication in 1934; the post check performed three years later, was designed to provide information for planning the second eradication.

The conditions surrounding the performance of the work may be described as normal. There were roads ranging from good to poor traversing the area in such manner that two miles was the maximum distance walked by any checker to or from the point of work. The terrain varied from flat and rolling to precipitous, and for the most part was better than average from a checking standpoint. All eradication types were represented; timber type covered the greater part of the area, whereas cutover and brush types formed a very small percentage of the whole. Stream type was not checked separately, although streams were numerous over the entire unit.

Method of Work Employed

All post checking was performed in accordance with the 1937 Checking Manual for California and Oregon, as prescribed for advance checking. An exception was made whereby all bushes were counted and the total feet of live stem were recorded for each 5-chain transect. The use of the "X" for large quantities of live stem was avoided. Eight strips were run in each section, thereby giving a $2\frac{1}{2}$ per cent check of the total area. Additional strips can always be run wherever doubt exists as to the true condition of parts of the area. Seedlings were recorded, but were not shown in the summarizations or on the maps. The number of one foot bushes present, other than seedlings, is given consideration in this report. Fruiting bushes were treated in a similar manner, being indicated on the data sheet by placing an F after the feet of live stem figure.

The camp was constructed and equipped to accomodate twelve men. The number of checkers on the job varied from three to eleven and for the season a total of twenty-seven men checked in the camp. This large

number is partly due to the operation of the checkers' training camps in connection with the post checking camp and to the temporary use of regular checkers in this work. The majority of checkers had relief status.

Since no experienced checker was available to direct the post checking work, all supervision was performed by the checking supervisor. On August 15, Checker Charles Lawson was placed in charge of the camp for the two weeks thereafter that the camp operated. The necessity of operating seven training schools for checkers during the course of the field season made it practical to conduct the training work at the Chicken Hawk Camp in order to facilitate the supervision over the checking.

The camp was opened on May 26, 1937 by Harris, Adams, Crowell, Warner, and Leahy. Checking was commenced on May 31 after control lines were run and section corners located, and was discontinued on September 1, when the camp was sent as a complete unit to the Lassen National Forest to act as a scouting party under the immediate supervision of Charles Lawson. The Chicken Hawk Camp had functioned for thirteen weeks at the time of its closing.

Work Performed and Results Accomplished

The accomplishments have been summarized in the following tables. Table No. 1 deals with acres by type and effective man days of checking:

TABLE NO. 1

ACREAGE AND MAN DAYS OF POST CHECKING

Eradication Type	Acres Covered by Post Check	Man Days on Check Strips*	Strip Acres	Per Cent of Check
Timber	17,235	173	418.3	2.4
Cutover	438	5-4/8	11.6	2.6
Brush	298	5-6/8	6.9	2.3
All Types	17,971	184-2/8	436.8	2.4

*Eight hour man days.

Table No. 2 deals with the Ribes population on the area post checked as revealed by the checking data for the separate types:

TABLE NO. 2

RIBES POPULATION BY TYPE

Eradication Type	Acres Covered by Post Check	Ribes Population			
		Total Ribes		Ribes per Acre	
		Bushes	F. L. S.	Bushes	F. L. S.
Timber	17,235	9,047	32,774	21.6	78.4
Cutover	438	395	3,760	34.1	324.1
Brush	298	270	1,284	39.1	186.1
All Types	17,971	9,712	37,818	22.2	86.6

Table No. 3 has been compiled to show the relation between Ribes per acre on the area in 1937 and the various concentrations that existed before the original working in 1934. Stream type has not been considered separately in this analysis. The number of bushes and amount of live stem for stream type are included in the upland type totals in the same manner that they are in advance checking.

TABLE NO. 3

COMPARISON OF RIBES POPULATIONS PRESENT IN 1934 AND 1937

Original Concentration	Acres	Strip Acres	Ribes per Acre in 1937	
			Bushes	F. L. S.
Less than 25 F.L.S.	1,369	34.0	4.4	33.3
25 F.L.S. to 30 bu.	9,410	230.3	14.0	63.3
31 to 200 bu.	3,134	71.5	23.0	97.7
201 to 1,000 bu.	3,595	86.9	41.8	130.5
Over 1,000 bu.	563	14.1	75.4	268.9
All Concentrations	17,971	436.8	22.2	86.6

Table No. 4 considers a division of bushes into size classes, giving the number of bushes for each class and the corresponding total feet of live stem.

TABLE NO. 4

CLASSIFICATION OF BUSHES BY SIZE

Size of Bushes in Feet of Live Stem	Bushes		Feet of Live Stem	
	Number	Per Cent of Total	Total Feet	Per Cent of Total
1	2,557	54.8	2,557	15.2
2-3	1,057	22.7	2,513	15.0
Sub-Total 1-3	3,614	77.5	5,070	30.2
4-8	642	13.8	3,479	20.8
9 and up	405	8.7	8,219	49.0
Sub-Total	1,047	22.5	11,698	69.8
Grand Total	4,661	100.0	16,768	100.0

Note: The above table is based upon data taken in eleven sections as follows:

T. 11 N., R. 14 E., M.D.M.
Sections 1-2-3-4-8-9-10-11-12-13-14

Discussion of Results

The Silver Creek unit was originally worked in 1934 by six eradication camps. The post checking of 1937 was performed in 34 sections, representing a part of the area worked by each of these six camps, thereby giving a fair sample of the entire area. The 17,971 acres post checked, as shown by Table No. 1, represent 61 per cent of the 29,655 acres worked by eradication forces in 1934.

This report presents the post checking data in tabular form for ready interpretation. It does not delimit the areas immediately in need of reeradication and makes no recommendation for future rework. No application of present maintenance standards has been made, this having been left entirely to the discretion of the operation supervisor. A large-scale map of the area checked on which the checking data are shown graphically is in the files of the Oakland office.

A minimum check of 2.5 per cent was intended by spacing the check strips 10 chains apart. The check attained, as shown in Table No. 1 for the entire area post checked, was 2.4 per cent. The question will arise of the sufficiency of a 2.4 per cent check and the answer will be found in the particular use that is made of the facts presented. It is believed

that those areas of light Ribes concentration should have additional intermediate strips run before any part of it is eliminated from further crew work. To cite two specific cases, reference is made to the following:

T. 11 N., R. 14 E., Section 13, S E $\frac{1}{4}$
T. 11 N., R. 15 E., " 17, N $\frac{1}{2}$

It is suggested that these areas have further check strips run because it appears possible to secure a fair amount of "blocked out" acreage thereby.

On the other hand it is concluded that a large part of the area can be reworked on the basis of the information presented; for example:

T. 11 N., R. 14 E., Section 10, N $\frac{1}{2}$
T. 11 N., R. 14 E., " 9, E $\frac{1}{2}$

It is further believed that for the next two years, or perhaps even longer, the Ribes conditions will change so little that the results of the post check will remain valid for that period. Areas that the post check indicates are now in need of a second working will certainly remain in that state until reeradication is performed upon them, hence they will need no further check. In areas of low Ribes population, the intermediate strips at whatever time they may be run, will disclose the status of Ribes regeneration, and hence the advisability of voiding, or accepting the original data.

The 1937 data provide an interesting measure of the efficiency of the checking methods used today. For the past three years the checkers have been developing a higher standard of proficiency which does not permit as great coverage as formerly, but does allow more thorough searching for Ribes. The closer supervision of the checking work by means of re-running check strips with the checker has likewise been an influence for greater efficiency. This supposition is borne out by referring to the checking data on the following sections:

T. 11 N., R. 14 E., Section 21, N $\frac{1}{2}$
T. 11 N., R. 14 E., " 22, N E $\frac{1}{4}$

On the basis of the advance checking done in 1934, a large part of the area advance checked was blocked out. The 1937 checking indicates an extensive growth of old Ribes bushes within the blocked out area which will require eradication if protection is desired.

The post checking data as shown on the 1937 map, reveal that certain small parts of the area were unworked originally, yet the regular check strips of 1934 running through these tracts indicate a Ribes-free condition. Reference is made to the following sections to verify the stated condition:

T. 11 N., R. 14 E., Section 14, W $\frac{1}{2}$
T. 11 N., R. 15 E., " 18, S E $\frac{1}{4}$

On other scattered sites there are many examples of large sized missed bushes as shown in the following sections:

T. 11 N., R. 14 E.,	Section	20, N E $\frac{1}{4}$
	"	13, S W $\frac{1}{4}$
	"	9, S E $\frac{1}{4}$
T. 11 N., R. 15 E.,	"	18, S E $\frac{1}{4}$
T. 11 N., R. 14 E.,	"	2, S W $\frac{1}{4}$
T. 12 N., R. 14 E.,	"	26, S W $\frac{1}{4}$

From Table No. 4, which classifies the bushes by size, it is noted that those of 9 feet or more of live stem make up 8.7 per cent of all bushes found, but that the live stem in these bushes makes up 49 per cent of the total live stem on the area today. It is significant that the average of the bushes of 9 feet of live stem, or more, is 23 feet per bush. These facts should not reflect against the 1934 eradication work, but should more properly be attributed to the lesser degree of accuracy with which the checking work was performed. It is further believed that the greater amount of rework experienced today with the use of relief labor is not wholly due to inferior labor, but to a large extent attributable to the closer searching of the check strip by the checker.

The relationship of Ribes population to type has been set forth in Table No. 2. The general theory that Ribes regeneration is greater in cutover types than in uncut types is substantiated by this table. The acreage in cutover and brush types is comparatively small. The rate of growth since the initial eradication three years previously cannot be accurately determined because the amount of live stem per acre remaining after eradication is not accurately known. If it be assumed that the area conformed to the 25 feet of live stem per acre at that time, and today has reached an average of 86 feet per acre, the difference will represent the increment for 3 years. The annual growth is therefore 20 feet per acre. This is mentioned to provoke further discussion.

The post checking data can be interpreted for the stream types by making a study of the original eradication records of 1934 pertaining to the individual streams. No general conclusions can be drawn because of diversified conditions found.

The relationship of the number of Ribes and feet of live stem per acre to the original concentrations is demonstrated in Table No. 3. All bushes recorded by the post check have been classified and grouped to correspond to the concentration grouping used on the permanent record maps for the same area in 1934. The bushes per acre and feet of live stem per acre were calculated and recorded for each concentration group, as shown in the table.

The first concentration of less than 25 feet per acre was originally eliminated from crew work as blocked out area. The post check reveals that an average of 33.3 feet of live stem per acre is present today. It is believed that this increase in the amount of live stem is due to subsequent growth, greater accuracy of the post check compared with the original regular check, and to irregularities in marking the boundaries of the blocked out areas at the time of the initial eradication.

The successive concentration groupings of Table No. 3 show a corresponding increase in the number of bushes and feet of live stem per acre revealed by the post check. This demonstrates roughly the rate of propagation of Ribes in areas of different concentrations.

The question of the advisability of working the areas of low original concentrations down to a relatively small number of feet of live stem per acre may be discussed in the light of the facts presented herein. In Table No. 2 we find for timber type an average of 78.4 feet of live stem per acre. In Table No. 4 it is shown that 49 per cent of the existing live stem on the whole area is in bushes having 9 feet or more; the same bushes that were large enough to have warranted digging during the 1934 eradication, assuming that in timber type the annual growth is small. It is reasoned that since 49 per cent of the present 78.4 feet per acre could have been eliminated with the first working, 38 feet might rightfully be expected to be the present live stem per acre for timber type. Assuming that this was possible, the conclusion is that a closer original eradication on areas of low concentrations is desirable in order to, if possible, put them on maintenance with the first eradication.

The post checking information reveals that the conditions on the area as a whole are such that reworking is justifiable as early as 1938. An analysis of the fruiting conditions is given in Table No. 5. (Based on data from Table No. 4.)

TABLE NO. 5

PROBABLE FRUITING STAGE OF RIBES BY SIZE CLASSES

Class	Size of Bushes, Feet	Number of Bushes	Per Cent of Total Live Stem	No. of Years Before Bearing Fruit	Remarks
1	1	2,557	15.2	3-4	70% young bushes 30% suppressed bushes
2	2-3	1,057	15.0	2-3	50% young bushes 50% suppressed bushes
3	4-8	642	20.8	0-2	10% under 3 years old 90% over 3 years old
4	9 and up	405	49.0	0	Old bushes, many bearing fruit

Since Class 4 is at present seed bearing and also contains 49 per cent of the 78.4 feet of live stem per acre, considering timber type only, (Table No. 2) it appears that the immediate need of reworking is mainly traceable to this group, which accounts for an average of 38 feet of live stem per acre bearing, or capable of bearing fruit. Class 4 is not the only fruiting class; 90 per cent of the bushes in Class 3 are probably more than 3 years old, and although many of these are suppressed, some are capable of fruiting.

Statement of Costs

For the 1937 annual report the costs of post checking have been computed on the basis of the total acres post checked. The cost of performing a 2.4 per cent check was 8.2 cents per acre. A 5 per cent check could have been made for approximately 16.4 cents per acre. Comparative costs with other types of checking are made in Table No. 6.

TABLE NO. 6

COMPARATIVE COSTS OF CHECKING
ELDORADO NATIONAL FOREST - 1937

Kind of Check	Cost per Acre on Basis of Total Acres Checked (Cents)*
Regular	20.8
Advance	12.9
Post	16.4

*Basis of 5 per cent check

The costs presented here are calculated to include 37 per cent of the checking supervisor's salary for five months spent in the field and a proportional amount of the appointed checker's accrued annual leave corresponding to the amount of time spent on post checking work.

Recommendations for Future Work

In consequence of an increasing amount of reeradication each year there will be a greater need for post checking information for the better planning of the operation. The proper time to make the post check is normally two or three years after the initial eradication. This will permit ample time to analyze the data through the winter and to embody it into the working plan before reeradication is attempted. Post checking should be a predetermined part of each operation working plan, thus permitting the checking staff to function smoothly and efficiently.

The setting up of a separate post checking camp is not desirable if an eradication camp is close enough to be utilized for housing the checkers. If the work is performed out of an eradication camp on a remote area, it is desirable to provide a truck for the sole use of the checking foreman and checkers.

The most effective number of men in a checking camp is as follows:

1 Cook . . . .(Second cook status)
1 Checking Foreman . . . .(Appointed)
7 Checkers . . . .(Appointed)

This conclusion is based on the experience gained by supervising a variable number of men during the season, ranging from two to twelve. Proper supervision of the work is reduced if more than seven checkers are used. It is possible to provide adequate transportation for seven checkers with one station wagon or pickup type of truck. The transportation factor is important in saving time and avoiding frequent moving of the camp.

Another factor to be considered is that of overburdening the cook. If the cook has relief status, it may be necessary to provide a substitute cook to handle the kitchen ten days of each month. This plan will provide flunky service for a part of the month while both men are on the job.

Frequent moving of the camp is to be avoided unless conditions strongly warrant it. The desirability of other camp sites and their relative accessibility to the post checking area will bear upon a question that can be answered properly in the field.

The use of a string along section boundaries is recommended because it is definitely believed that it will result in more accurate field work and in a considerable saving of time in tying in the strips. It also provides a ready means of supervising and controlling the work of the checkers.

The use of relief labor as checkers is not recommended. Although a few of these men may perform their work satisfactorily, others who are less efficient, may lend an uncertainty to the accuracy of all the data collected.

Conclusion

The discussion of the work and the recommendations made are all based on first hand observations in the field and are to a certain extent supported by figures. Since post checking will occupy a greater amount of attention in the future, it is fitting that these opinions be brought up for discussion. Conditions on the forests vary; only the general principles can be applied universally. The results found on the Silver Creek Unit of the Eldorado operation cannot be a measure of the conditions on any other unit. Only a post check on the individual areas will reveal the true situation there.

Acknowledgment is made to Carl Fowler and S. D. Adams for their assistance in the preparation of the tables used in this report.

PART IV

CONTROL RECONNAISSANCE IN OREGON, 1937

By

C. P. Wessela, Associate Forester, and
Lyle N. Anderson, Agent

INTRODUCTION

From January 1 to May 6, 1937, a reliefer reconnaissance party composed of a foreman, six mappers, a clerk, and a cook and flunky were employed on the Siskiyou National Forest and adjoining patented land. This marked the first attempt of accomplishing reconnaissance work during the winter months. The party was quartered in a rented building, and their work confined to the lower elevations. It was, of course, impossible to obtain an accurate Ribes count, however, accurate type mapping, and an accurate count of sugar pine trees by diameter classes were obtained. Weather conditions were often very unfavorable. During January and February, a large amount of the work was done on snow shoes, and as a result costs are slightly higher than usual.

Beginning on November 4, 1937, a group of eleven reliefers, under the direction of the Oregon checking supervisor, began work on the Siskiyou Control Unit. However, extremely wet weather during the entire month of November made it practically impossible to map. Owing to continued inclement weather the party was disbanded late in November.

Because of a large amount of marginal sugar pine type, and the absence of reliable cruise figures, there remain approximately 150,000 acres on the Siskiyou Control Unit and about 75,000 acres on the Umpqua Control Unit to be covered by systematic reconnaissance. Until this is done, no accurate figures on the exact amount of acreage which has adequate value to justify protective measures can be obtained. With blister rust becoming firmly entrenched in southern Oregon, it becomes increasingly important that reconnaissance be completed promptly in order that a coordinated and effective plan of attack may be put into effect.

DESCRIPTION OF AREA COVERED

Since the greater portion of reconnaissance work was done during the winter months, activities were confined to the lower elevations in the vicinity of Grants Pass. The timber on most of the area was logged several years ago, and since then repeated burning has prevented the establishment of normal sugar pine reproduction; however, several small areas do support a fair stand of young sugar pine trees. Ribes occur in light to medium concentrations; however, several small farms are interspersed throughout the tract and it is in these clearings that the greater part of the Ribes growth occurs. Sugar pine type as a whole is more or less marginal because of repeated fires.

METHODS OF WORK

The mechanical methods used in collecting data and in making the type maps were the same as those used in previous years. Briefly, these methods are: four strips per section are run in a cardinal direction through the section, in the course of which the different timber types and ground cover types are determined. In addition, all the Ribes by species and the sugar pine by two size classes, 0' to 8" and over 8" are counted on a strip one-fourth chain in width. Distances are measured by pacing and courses are determined by box compass. Strips are run at right angles to the drainages as nearly as a cardinal direction will permit in order to obtain a representative sample.

RESULTS

During 1937, all or parts of 130 sections, totaling 78,575 acres, were covered by reconnaissance. Table No. 1 gives a list of the sections worked by townships.

TABLE NO. 1

SECTIONS WORKED BY RECONNAISSANCE IN WHOLE OR IN PART
SISKIYOU NATIONAL FOREST, OREGON - 1937

*Township	Range	Section	Number of Sections	Acres Covered
34-S	7-W	36	1	640
34-S	6-W	29, 31, 32	3	1,920
35-S	7-W	1, 11, 12, 13, 14, 23	6	5,311
35-S	6-W	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36	36	23,040
36-S	7-W	1, 2, 11, 12, 13, 14	6	2,293
36-S	6-W	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24	24	11,681
37-S	8-W	25, 26, 34, 35, 36	5	3,200
37-S	7-W	27, 28, 29, 31, 32, 33, 36	7	4,450
38-S	8-W	1, 2, 3, 4, 9, 10, 11, 12, 13, 14, 15, 22, 23, 24, 25, 26, 27, 33, 34, 35, 36	21	13,200
38-S	7-W	3, 4, 5, 6, 7, 8, 9, 10, 16, 17, 18, 19, 20, 21, 28, 29, 30, 31, 32, 33	20	12,800
39-S	8-W	4	1	40
Totals			130	78,575

* Willamette Meridian

The effective man days spent on reconnaissance work were 293 at a total cost of $3,974.05, or a cost per acre of $0.0506.

PART V

SCOUTING FOR BLISTER RUST IN THE SUGAR PINE REGION, 1937

By

S. Daryl Adams, Agent

INTRODUCTION

Yearly in mid-summer scouting for white pine blister rust in southern Oregon and northern California begins. In 1936 several blister rust infections on sugar pine were found in southern Oregon, principally in the vicinity of Panther Mountain and at Windy Valley in Curry County not far from the coast. To determine whether these centers or others farther north and east had spread the disease into the Siskiyou Mountains along the southern border of the state or into the Cascades of Jackson and Douglas Counties, the scouting project was organized in Oregon in July 1937.

During 1936 five infections of rust, one on sugar pine and Ribes and the others on Ribes only, were found on the Klamath National Forest of northwestern California a few miles south of the Oregon boundary. These were the first discoveries of blister rust in California. The principal objective of scouting work in California during 1937 was to ascertain the southward spread of the disease in the state along the Coast Range and the Sierra Nevada. Accordingly a party was assigned to the Trinity National Forest in the Coast Range Mountains south of the Klamath Forest, and was later moved to the southern end of the Lassen Forest in the Sierra Nevada after the presence of the rust on the Trinity had been established. Another party was assigned to the western Lassen Forest, and the Oregon party was detailed for six weeks to the Klamath to learn what intensification the disease had made in that region. These were the principal scenes of scouting activity in California and Oregon during 1937.

ORGANIZATION AND METHODS OF WORK

Oregon

Regular scouting by an organized crew in southern Oregon was begun early in July and continued until August 23, when the party was moved to northern California where it remained until the middle of October. The party was then moved back to Oregon and was retained there until the end of October when it was disbanded.

Because of the WPA regulations governing the expenditure of funds, it was impossible to employ more than one appointed, trained man for scouting work. As a result it became necessary for this man to train and take charge of a group of security wage workers, who were selected from the checking and eradication crews. By the latter part of July, a party of five fairly capable scouts and a cook had been selected. Some of these men proved themselves later in the season exceptionally capable of detecting the disease.

When time permitted, members of the Oregon permanent personnel scouted in various parts of southern Oregon and northern California, often in conjunction with other work.

For the most part, scouts worked in pairs, covering the areas by drainage basins. As the scouting season progressed, it became apparent that stream bottoms, which were well screened by brush and trees, offered poor scouting conditions, so that more attention was given to areas supporting open brush, or open forest growth, such as logged areas. Whenever an infected Ribes bush was found, a thorough search was made in the immediate vicinity for other infected bushes. If more were found, the area was searched carefully for infected pines under the personal direction of the chief of the party. The scouting program had as its objective the finding of fruiting pine cankers through the discovery of infection on Ribes.

California

1. Trinity Party

On August 8 a scouting party consisting of six appointed men, a "reliefer" cook, and S. D. Adams as chief of party established camp on the southern end of the Trinity National Forest near Hayfork. Scouting continued on the Trinity until the party was transferred to the Lassen National Forest on September 30. During the seven weeks on the Trinity, work was carried on from six camp sites which were located on roads leading into the areas to be scouted. Since several localities could not be reached by truck, it was necessary to make overnight "back pack" trips into them. Wherever roads existed the problem of moving men and camp equipment was readily solved, as two pickups and a Dodge "screen side" truck furnished the transportation.

Ribes and sugar pines along the streams, roads, and trails were systematically examined. In order to make these inspection trips as efficiently and safely as possible, the scouts worked in pairs. Each scout was supplied with a pocket compass, field note book, contour map of the area, knapsack, and a pair of Wiss pruning shears for cutting off branches of the host plants. A detailed report of the day's work was made at night.

2. Lassen Parties

Because blister rust was found in the Coast Range on the southern end of the Trinity Forest fully 125 miles south of the Oregon border, it was decided early in September to put a party on the Lassen Forest to scout the western slope of the Sierra Nevada. The party consisted of five security wage workers and a cook in charge of Charles Lawson, an appointee. The area scouted extended from Mineral in the south to the vicinity of Latour Butte in the north. Essentially the same method of work was employed as that used by the Trinity crew.

On September 30 the Trinity party was moved to the southern Lassen Forest in the vicinity of Butte Meadows in the attempt to determine the southernmost extension of the rust. Here scouting was terminated on October 12 because of unfavorable weather and the defoliated condition of the Ribes.

3. Plumas Party

During September the Plumas operation supervisor and one "reliefer" devoted part of their time to scouting in the vicinity of Lake Almanor and Deer Creek Meadows. This work was conducted from the Butt Lake Eradication Camp (eight miles south of Lake Almanor). Transportation was furnished by the camp truck (while hauling crews to work) and the operation supervisor's pickup.

4. Klamath Party

From the end of August to the middle of October the Oregon crew headed by Gayford Wilson scouted the Klamath Forest in California on both sides of the Klamath River from Hilt in the east to Happy Camp in the west, and the Shasta Forest along the headwaters of the Sacramento River.

DESCRIPTION OF AREAS SCOUTED

Southern Oregon

Douglas County: A portion of the Cow Creek drainage basin near Azalea and Glendale, and the North Fork of the Rogue River in the vicinity of Union Creek (the Upper Rogue Blister Rust Control Unit) were the only areas covered in this county.

The Cow Creek basin supports many Ribes both in stream type and in upland types. *Ribes sanguineum*, on which more infection was found than on any other species during 1937, is very abundant. Although sugar pine is not present in sufficient quantities to warrant protection, there are enough trees to cause the rust to intensify considerably within a few years. Fourteen infected bushes were found, well scattered over the area. Further scouting would undoubtedly have revealed much more infection.

That part of the North Fork of the Rogue River drainage which lies in Douglas County supports a dense stand of timber of which western white pine forms about 20 per cent. Numerous, wide, swampy streams, supporting along their banks dense concentrations of *R. bracteosum* and other Ribes associated with a dense growth of brush and other plants, traverse the area. No infection was found in this part of the Rogue River drainage.

Josephine County: A small area near and on Reuben Mountain and a part of the Swede Basin area were the only tracts covered in this county. An overmature stand of sugar pine with an understory of dense brush interspersed with exceptionally heavy stands of sugar pine reproduction characterize the Reuben Mountain area. Topography is extremely rugged, and Ribes, of which *R. cruentum* is most common, are moderately abundant but well distributed through the sugar pine type. In this area eighty-four infected Ribes were found in one five-acre tract. The Swede Basin area is very similar to the Reuben Mountain tract; only two infected Ribes bushes were found there.

Jackson County: Five separate areas were scouted in this county, namely, that portion of the Upper Rogue River lying in the county, the Evans Creek drainage basin, the Butte Falls area, the Pinehurst area, and the Wagner Creek basin. All these areas support stands of sugar pine in varying quantities; a stand of western white pine grows in the Upper Rogue. Ribes occur in varying concentrations; however, along the streams, which are numerous, are an abundance of susceptible Ribes. Ribes sanguineum, R. bracteosum, R. klamathense, and R. cruentum are the species of most importance in scouting.

Two infected Ribes were found in the Upper Rogue, one hundred and ten in the Evans Creek basin, eight in the Butte Falls area, eight in the Pinehurst area, and four in the Wagner Creek basin. Blister rust infection on Ribes appears to be generally spread over the entire county. In addition, one bush in the Butte Falls area and eight in the Pinehurst were found to be infected with Cronartium occidentale.

Northern California

Siskiyou County: Intensive scouting was done along all the tributaries on the north side of the Klamath River from Hungry Creek west of Hilt to and including Indian Creek near Happy Camp, and on the south side from Humbug Creek to Elk Creek. Except for the Beaver Creek drainage basin, the north side of the Klamath River is characterized by a stand of sugar pine of all age classes growing some distance from the larger stream bottoms. Streams are numerous and are densely populated with susceptible Ribes, of which R. bracteosum and R. klamathense are the most important. Some distance from the streams an abundance of R. sanguineum occurs in the better sugar pine type. A large part of the infection in this belt was found at the junction of the stream and the upland types. As R. cruentum is well scattered through the upland, it constitutes a real menace to the sugar pine because of its close association with the primary host.

The Beaver Creek drainage basin differs from the others examined in being cutover in large part. A type of open reproduction predominates with many susceptible Ribes growing in the upland types closely associated with small sugar pine trees. In fact some infected R. sanguineum bushes were found to have their branches entwined with the branches of sugar pine trees.

Scouting conditions on the south side of the Klamath River are not so favorable as those on the north side. Sugar pine is not so plentiful and Ribes are not so numerous because of a more arid condition.

Trinity County: The western part of the Trinity National Forest, largely in Trinity County, consists of a series of parallel rivers flowing northwest separated by prominent ridges remarkable for their length and constant direction. Sugar pine of moderate quality and Ribes of many species are abundant. As northerly winds frequently blow over the region during the time of spore dissemination, and as they must pass first over the blister rust infections in southern Oregon and northern Siskiyou County, it seemed likely that blister rust must already have established itself at some point south of the Klamath Forest.

W-2111 - TRUNK AND LIMB CANKERS CAUSED BY WHITE PINE BLISTER RUST ON 12 YEAR OLD WHITE PINE

W-1858 - SUGAR PINE KILLED BY BLISTER RUST. NOTE TOP OF TREE BROKEN OFF ABOVE THE WELL DEVELOPED TRUNK CANKER; THIS IS TYPICAL OF THE ACTION OF THE DISEASE.

The country at the headwaters of the Hayfork of the Trinity River which was selected first for scouting, was worked from the camp site at Cold Spring, twelve miles south of Hayfork, California. From the second camp site, White Rock Ranger Station, the upper drainage basin of the South Fork of the Trinity River was scouted. A fair stand of sugar pine grows on this area; Ribes are common along the streams, but occasional in the upland, the principal species being R. cruentum, R. nevadense, and R. lobbii. Streams that afforded good scouting were Dubakella, Salt, Hayfork, Texas Chow, and Prospect Creeks.

The area that received the most intensive scouting was the northeastern slope of South Fork Mountain, a long, high, uniformly shaped ridge, situated between the Mad River and the South Fork of the Trinity River. A good stand of virgin sugar pine extends for practically the entire 40 miles of the northeastern slope. Ribes are common to abundant in the upper reaches of the streams, but are occasional to rare at the stream mouths and in the upland. The presence of the more susceptible of species of Ribes, R. bracteosum, R. sanguineum, and R. cruentum, afford good scouting conditions; R. lobbii and R. lacustre are also common.

In order to cover the entire northeastern slope of South Fork Mountain, three camp sites, situated on the road that extends along the crest of the mountain, were used. (The camp at the northwestern end of the road was in Humboldt County.) Scouting consisted of examining the many streams which drain northward and eastward into the South Fork of the Trinity River. The inspection of a stream from the ridgetop road to the Trinity River, a distance of approximately three miles airline, and often involving a descent and an ascent of more than 3,000 feet, was an average day's work for two men. Although the upland type is fairly open, the streams are brushy and rocky. The several trails leading from the road to the river were also inspected. The best scouting conditions were found along Bierce, Happy Camp, Hitchcock, Cold Spring, and Kerun Creeks, Granite Canyon, and Rough Gulch.

The sixth and last camp on the Trinity National Forest was located on Donaldson Creek about ten miles north of the town of Hayfork. The area surrounding this camp site is a very dry region having a southern exposure and supporting a poor stand of sugar pine. Ribes cruentum is common on the upland and R. sanguineum along the streams. The poorest scouting conditions on the Trinity National Forest were found here.

Humboldt County: One camp site, Blake Lookout, was in Humboldt County; from this site the northwestern end of the South Fork Mountain was covered. The area has been described above. The best scouting conditions were found along Big Creek and Lucy Gulch.

Butte and southern Tehama Counties: The area examined by the Trinity party from the Butte Meadows Camp was partly in Butte and partly in Tehama Counties on the southern end of the Lassen National Forest. It is largely cutover land with which is interspersed a small amount of virgin timber. Ribes are abundant, especially R. roezli and R. nevadense; and sugar pine reproduction occurs in such quantities as to offer good scouting. As most of the district slopes toward the south,

it is as a whole very dry. Scouting on Butte Creek and the West Branch of the Feather River was hindered by brush, rocky bluffs, and high water. Some of the streams along which good scouting conditions exist are Bottle, Bull, Cascade, Colby, Secret, and Inskip Creeks. Nearly all parts of the area are readily reached by state roads, logging roads, and trails.

Tehama and southern Shasta Counties: On the western side of the Lassen National Forest the region examined extends from the vicinity of Mineral north to the vicinity of Latour Butte. Sugar pine is plentiful and of good quality; Ribes, (principal species R. roezli and R. nevadense) are abundant except in places from the Mineral Summit to the vicinity of Viola. Generally scouting conditions are good. Two camp sites were used, the first at Mineral and the second on Rock Creek.

A few days were spent in Deer Creek Meadows along Deer and Elam Creeks, where the association of sugar pine and Ribes is good.

Plumas County: In Plumas County the upper branches of the North Fork of the Feather River, the cutover area around Camp Prattville (on Lake Almanor), and the district between Mt. Dyer and Lake Almanor were scouted. This region supports an abundance of R. roezli and sufficient sugar pine to make scouting good.

RESULTS OF SCOUTING

Southern Oregon

Tables Nos. 1, 2, and 5 present a detailed analysis of scouting results in southern Oregon.

Scouting during 1937 revealed a very general and uniform spread of the disease to Ribes. Although it was impossible to devote much time to this project, blister rust infection was found in every region covered. Of particular significance is the large number of infected bushes found in the vicinity of Reuben Mountain, in the heart of a proposed control unit.

A total of 19,855 Ribes plants were examined, of which 257, or 1.3 per cent, were found to be infected with blister rust. This condition is most certain to result in a sizable amount of sugar and white pine infection.

Northern California

Tables Nos. 3, 4, and 5 show the results of scouting in California during 1937. A total of 76,336 Ribes were examined, of which 223 or 0.3 per cent were infected with blister rust.

As Table No. 4 indicates, blister rust infection on Ribes was generally distributed over northern Siskiyou County; it was greater in amount on the northern side of the Klamath River than on the southern. Many infected bushes were found in the Beaver Creek drainage basin both in the upland and in stream type; they were especially abundant in the vicinity of Hungry Creek. The most noteworthy discoveries on the southern side of the Klamath River consisted of a large number of infected

bushes in a small swamp near the mouth of Grider Creek, and of infected R. cruentum along Elk Creek at the edge of the Marble Mountain Primitive Area.

During the very first days of work in Trinity County, a single R. nevadense was found infected with blister rust. It was growing along Dubakella Creek, which is about 100 miles south of the infections in northern Siskiyou County that were discovered in 1936. Within the next few weeks four more diseased bushes were found in the same district, as Table No. 4 shows. Two infections on South Fork Mountain and one north of the town of Hayfork completed the discoveries in this county.

Along Mill Creek in Tehama County (Lassen National Forest) two R. roezli were found infected with blister rust. This discovery, made five miles south of Lassen Volcanic National Park and 125 miles south of the Oregon boundary, placed the rust in the Sierra Nevada for the first time.

The blister rust infections in Shasta County, several in Siskiyou County, and two in Trinity County were found by members of the Division of Forest Pathology, Bureau of Plant Industry.

No diseased white pines were disclosed in California or Oregon by the scouting parties during 1937. However, the prevalence of infected Ribes indicates that during the spring of 1937 blister rust spores were dispersed widely over southern Oregon and northern California. Although the source of these spores is unknown, it is probable that, owing to their general distribution, they came from a considerable distance to the north. Thus sugar pine and other white pines growing over a wide area, which has hitherto been comparatively free of infection so far as scouting results indicate, were exposed to blister rust throughout 1937. In 1939 the disease will become visible on these trees which will then be centers of infection for further spread and intensification of blister rust.

Two pinyon rust (Cronartium occidentale) infections were found near Mineral by the Lassen Party.

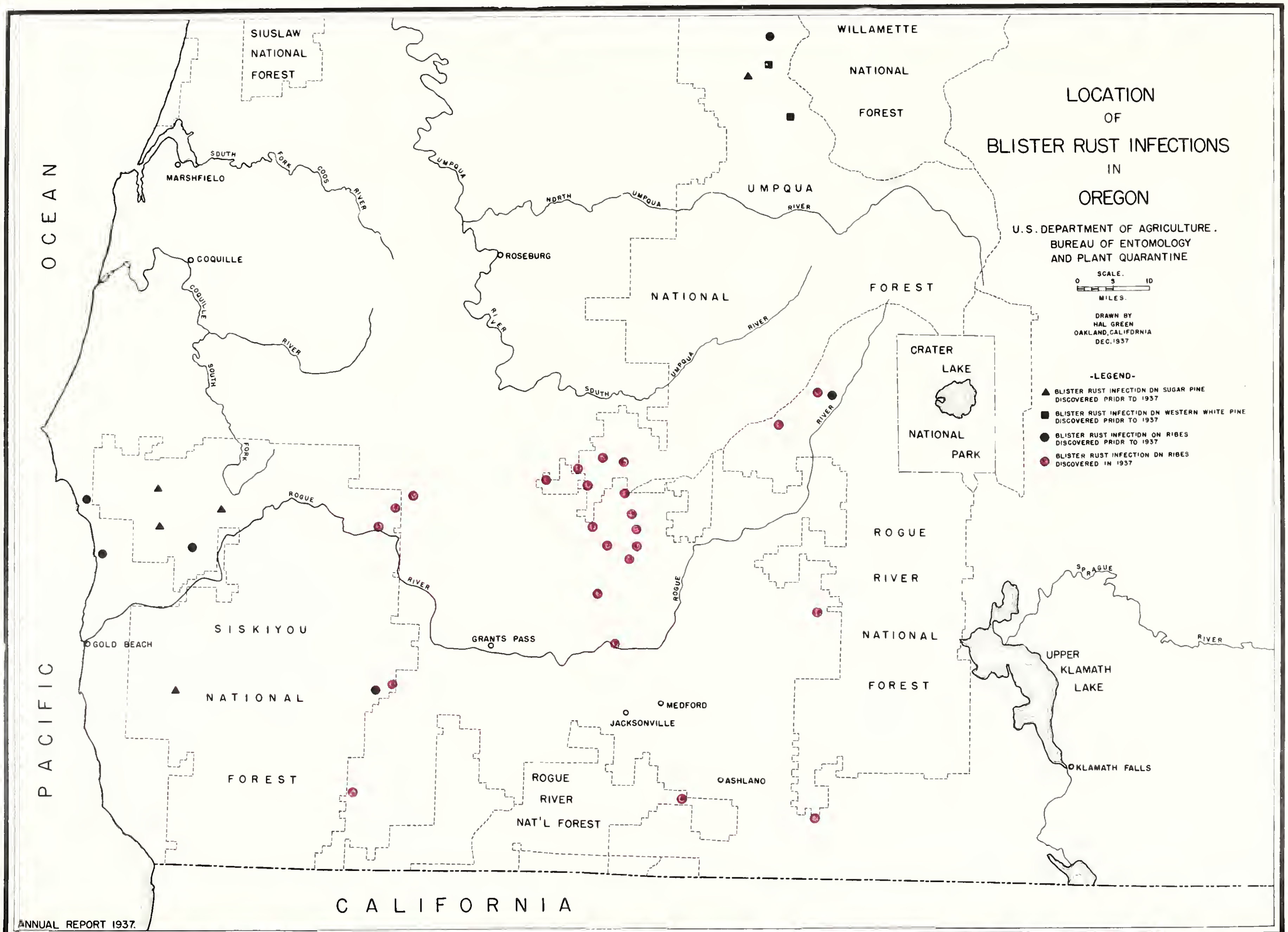

LOCATION
OF
BLISTER RUST INFECTIONS
IN
OREGON
U.S. DEPARTMENT OF AGRICULTURE.
BUREAU OF ENTOMOLOGY
AND PLANT QUARANTINE
SCALE.
0
5
10
MILES.
DRAWN BY
HAL GREEN
OAKLAND, CALIFORNIA
DEC. 1937
-LEGEND-
BLISTER RUST INFECTION ON SUGAR PINE DISCOVERED PRIOR TO 1937
BLISTER RUST INFECTION ON WESTERN WHITE PINE DISCOVERED PRIOR TO 1937
BLISTER RUST INFECTION ON RIBES DISCOVERED PRIOR TO 1937
BLISTER RUST INFECTION ON RIBES DISCOVERED IN 1937
OCEAN
PACIFIC
SIUSLAW NATIONAL FOREST
WILLAMETTE NATIONAL FOREST
UMPQUA NATIONAL FOREST
CRATER LAKE NATIONAL PARK
ROGUE RIVER NATIONAL FOREST
SISKIYOU NATIONAL FOREST
ROGUE RIVER NAT'L FOREST
MARSHFIELD
COQUILLE
ROSEBURG
GOLD BEACH
GRANTS PASS
MEDFORD
JACKSONVILLE
ASHLAND
KLAMATH FALLS
UPPER KLAMATH LAKE
SOUTH FORK COOS RIVER
COQUILLE RIVER
SOUTH FORK
NORTH UMPQUA RIVER
UMPQUA
SOUTH UMPQUA RIVER
ROGUE RIVER
SPRAGUE RIVER
CALIFORNIA
ANNUAL REPORT 1937.

TABLE NO. 1

NUMBER OF RIBES AND PINES EXAMINED FOR BLISTER RUST IN SOUTHERN OREGON DURING 1937

Host Species	Number of Host Plants Examined in Each County			
	Douglas	Josephine	Jackson	All Counties
Ribes:				
R. aureum	-	-	34	34
R. binominatum	313	-	260	573
R. bracteosum	4,841	-	3,810	8,651
R. cruentum	404	1,366	248	2,018
R. erythrocarpum	110	-	-	110
R. klamathense	15	80	486	581
R. lacustre	2,127	-	952	3,079
R. lobbii	140	115	899	1,154
R. sanguineum	783	604	2,138	3,525
R. viscosissimum	55	-	75	130
Total	8,788	2,165	8,902	19,855
Pines:				
P. monticola	302	-	175	477
P. lambertiana	205	435	332	972
Total	507	435	507	1,449

TABLE NO. 2

BLISTER RUST INFECTIONS FOUND IN OREGON
DURING 1937

County	Locality	Willamette Meridian			Host Infected		Remarks
		Twp.	R.	Section	Species	No.	
Douglas	Cow Creek	32S	4W	20,28,29 31 & 32	R. sanguineum R. cruentum	6 3	Association with sugar pine poor. Infected bushes widely scattered.
	Cow Creek	32S	3W	3,10,15	R. sanguineum	5	Fair Ribes-pine association.
	Diamond Rock	32S	2W	16	R. sanguineum	4	Average distance to sugar pine 100 ft.
	Reuben Mountain	33S	7W	5 & 6	R. cruentum R. sanguineum R. lobbii	3 7 2	Abundant sugar pine of all age classes near infection.
Josephine	Reuben Mountain	33S	8W	13	R. cruentum R. sanguineum	81 3	Nearly 100 infected bushes in 5 acre area in close association with dense S.P. repro.
	Benton Mine	33S	8W	27	R. cruentum	1	Ribes heavily infected.
	Wolf Creek Post Mountain	33S	5W	22	R. sanguineum	7	Average distance to S.P. 50 to 100 ft.
	Swede Basin	37S	8W	13	R. sanguineum	1	A very light hit.
	Redwood Ranger Station	39S	8W	20	R. klamathense	2	Average distance to sugar pine 50 ft.
Jackson	Flat Creek	30S	3E	22	R. bracteosum	1	A light hit on one leaf.
	Buck Basin	31S	2E	15	R. sanguineum	1	In open sugar pine repro.
	Goolaway Gap	32S	3W	31	R. lobbii	1	Average distance to sugar pine 150 ft.
	Railroad Gap	32S	2W	31	R. sanguineum	3	Poor association with sugar pine.
	Evans Creek	33S	3W	27,28,32, & 34	R. bracteosum R. lobbii R. sanguineum	2 3 4	Infected bushes generally spread throughout these sections.

TABLE NO. 2 (Concluded)

BLISTER RUST INFECTIONS FOUND IN OREGON
DURING 1937

County	Locality	Willamette Meridian			Host Infected		Remarks
		Twp.	R.	Section	Species	No.	
Jackson	Evans Creek	33S	2W	17	R. klamathense	1	
	Blizzard Gulch	33S	2W	27 & 33	R. sanguineum R. lobbii R. klamathense	15 1 2	Infected bushes fairly concentrated indicating local intensification.
	West Fork Evans Creek	34S	3W	10 & 15	R. sanguineum R. cruentum	21 3	Very heavy Ribes infection along streams.
	Evans Creek	34S	2W	16	R. klamathense	1	
	Ramsey Creek	34S	2W	31	R. sanguineum R. lobbii	36 1	Heavy Ribes infection in close association with sugar pine.
	Sardine Creek	35S	3W	20	R. sanguineum	15	15 infected bushes in one small area.
	Butte Falls	35S	3E	18,19,20, 21 & 28	R. sanguineum R. klamathense	3 5	Upon cutover land with scattered sugar pine reproduction.
	Gold Hill	36S	3W	22	R. aureum	1	
	Wagner Creek	39S	1W	27	R. sanguineum	4	Found in old homestead clearing.
	Pinehurst	40S	3E	2 & 4	R. sanguineum	8	Infection near sugar pine of all ages.

TABLE NO. 3

NUMBER OF RIBES AND PINES EXAMINED FOR BLISTER RUST IN CALIFORNIA DURING 1937

Host Species	Number of Host Plants Examined in Each County								
	Butte	Humboldt	Lassen	Plumas	Shasta	Siskiyou	Tehama	Trinity	All Counties
Ribes:									
R. aureum	-	-	-	-	-	1	-	-	1
R. binominatum	-	45	-	-	-	300	-	878	1,223
R. bracteosum	-	1,325	-	-	-	2,021	-	5,766	9,112
R. cereum	-	-	-	149	363	95	2	-	609
R. cruentum	-	120	-	-	815	9,191	360	3,908	14,394
R. divaricatum	-	-	-	-	-	-	-	353	353
R. inerme	78	-	-	123	916	-	698	-	1,815
R. klamathense	-	-	-	-	-	4,747	-	-	4,747
R. lacustre	-	61	-	-	-	1,028	503	2,484	4,076
R. lobbii	-	74	-	-	370	1,699	273	1,847	4,263
R. montiginum	-	-	-	-	310	-	-	-	310
R. nevadense	2,591	3	17	753	1,474	2,040	2,286	3,059	12,223
R. roezli	2,105	-	50	2,159	3,865	691	5,379	-	14,249
R. sanguineum	-	188	-	-	25	5,921	-	1,644	7,778
R. viscosissimum	55	80	17	163	109	210	128	172	934
R. watsonianum	-	-	-	-	-	-	-	249	249
Total	4,829	1,896	84	3,347	8,247	27,944	9,629	20,360	76,336
Pines:									
P. lambertiana	51	93	8	191	571	2,818	479	1,409	5,620
P. monticola	-	-	-	23	136	-	45	5	209
Total	51	93	8	214	707	2,818	524	1,414	5,829

TABLE NO. 4

BLISTER RUST INFECTIONS FOUND IN CALIFORNIA
DURING 1937

County	Region	Twp.	R.	Sec.	Host Infected Species	No.	Remarks
		Mt. Diablo Mer.					
Siskiyou	Hungry Creek and Cottonwood Creek	48N	7W	29, 30	R. sanguineum	23	The infected area is one-half mile long, sugar pine is common.
	Beaver Creek	48N	8W	21	R. sanguineum	1	Very light infection.
	Raster Gulch	48N	8W	24 25	R. sanguineum	31	The infected area is 1 mile long.
	Hungry Creek Chapman Gulch	48N	8W	25 26 35 36	R. sanguineum R. cruentum R. viscosissimum	33 5 1	The infected bushes were found along Chapman Gulch and Hungry Creek over an area 3 miles long.
	Daggett Creek	48N 47N	9W	34 3	R. klamathense	3	Very light infection.
	West Fork of Beaver Creek	48N	9W	29	R. cruentum	2	The nearest sugar pine was five chains from the infected bushes.
	Silver Creek	48N	10W	24	R. sanguineum	2	Sixty feet to nearest sugar pine.
	Shovel Creek*	47N	3W	25	R. petiolare	2	About 90 leaves showed uredinia or telia. No sugar pine within several miles.
	Cottonwood Creek	47N	7W	4	R. sanguineum	5	150 feet to the nearest sugar pine.
	Beaver Creek	47N	8W	13 24	R. cruentum	9	Fifty feet to the nearest sugar pine.
	Beaver Creek	47N	9W	12	R. cruentum	1	Very light infection.
	Sicad Creek	47N	11W	17	R. cruentum	4	Good Ribes - sugar pine association.
	Horse Creek	47N	11W	35 36	R. sanguineum	7	Good scouting conditions.
	Klamath River	46N	9W	11	R. cruentum	1	Very light infection.
	Middle Creek	46N	10W	5	R. klamathense	2	Small infection 400 feet from sugar pine.
	Grider Creek	46N	12W	14 23	R. cruentum R. klamathense R. lobbii	18 1 18	Average distance to sugar pine was thirty feet.
	Upper Long Gulch* near Yreka	45N	7W	17	R. cruentum	1	Two leaves infected. Several sugar pine in this vicinity.

* Discovery made by members of the Division of Forest Pathology (Bureau of Plant Industry)

TABLE NO. 4 (Continued)

BLISTER RUST INFECTIONS FOUND IN CALIFORNIA
DURING 1937

County	Region	Twp.	R.	Sec.	Host Infected: Species	No.	Remarks
Siskiyou	Klamath River near Hamburg	Mt.Diablo Mer. 45N	11W	12	R. cruentum	1	Very light infection.
	Bear Creek	44N	12W	19	R. cruentum	1	Very light infection.
	West Fork of * Parks Creek	41N	6W	3	R. cruentum	1	A single leaf infection on a dry site. No sugar pine for some distance.
	Near Bartle*	40N	2E	31	R. cruentum	1	Only one leaf infected. Sugar pine abundant
	East Fork of Indian Creek	Humboldt Mer. 18N	7E	16	R. cruentum	1	The infected bush was less than one chain from sugar pine.
	Thompson Creek	18N	7E	13 25	R. bracteosum R. sanguineum	2 1	Infection present for two miles along the Thompson Creek at the mouth of Cedar Creek.
	Indian Creek	18N	7E	32	R. sanguineum	5	Infection scattered over an area ¼ mile long
	Indian Creek	18N	6E	11 14 23	R. sanguineum	3	Light infection three miles long.
	Thompson Creek (near mouth) and Klamath River	17N	8E	6 17 20 21	R. bracteosum R. cruentum R. klamathense	1 1 4	Ribes infection scattered along the last 2 miles of Thompson Creek and one mile of Klamath River below mouth of Thompson Creek.
	Indian Creek	17N	7E	4 9 15	R. bracteosum R. sanguineum R. cruentum	8 1 4	Light infection extends one mile up East Fork of Indian Creek above mouth and south along Indian Creek to Indian Creek Ranger Station.
	Klamath River	16N	7E	12	R. klamathense	1	One hundred feet to nearest sugar pine.
	Little Grider Creek	16N	7E	16	R. bracteosum	1	Few leaves infected.
	Elk Creek (near Elk Creek Guard Station)	15N	8E	27	R. cruentum	2	Infected bushes were found within one chain of sugar pine.

* Discovery made by members of the Division of Forest Pathology (Bureau of Plant Industry)

TABLE NO. 4 (Concluded)

BLISTER RUST INFECTIONS FOUND IN CALIFORNIA
DURING 1937

County	Region	Twp.	R.	Sec.	Host Infected Species	No.	Remarks
		Mt. Diablo Mer.					
Shasta	Clear Creek*	36N	6W	33 34	R. nevadense	2	Thirteen leaves infected. Sugar pine abundant.
	South Fork of Montgomery Creek*	34N	1E	15	R. nevadense	2	Only two leaves infected. Sugar pine rare on this area.
Tehama	North Side of Mill Creek	29N	4E	27	R. roezli	1	Infection on three branches of the bush. One hundred feet to nearest sugar pine.
	Mill Creek (about 3/4 mile above the Hole-in-the-Ground Public Camp)	28N	4E	4	R. roezli	1	Two hundred fifty feet to the nearest sugar pine. This infection marks the southern limit of known white pine blister rust infection in the Sierra Nevada.
Trinity	Donaldson Creek	32N	12W	12	R. sanguineum	1	Few leaves infected.
	Salt Creek	29N	11W	7	R. cruentum	1	Few leaves infected.
	Dubakella Creek	29N	11W	20	R. nevadense	1	Sugar pine common on this area.
	Goat Camp - Hayfork Creek	29N	11W	34 35	R. nevadense	2	Very good pine - Ribes association.
	On Red Mountain-White Rock Road*	28N	11W	11	R. cruentum	1	Only one leaf infected. Sugar pine abundant.
	Happy Camp Creek	28N	12W	35	R. sanguineum	1	Only a few leaves infected on the bush.
	Shell Creek	27N	11W	17	R. sanguineum	1	Sugar pine occasional. This infection marks the southern limit of known white pine blister rust infection in California.

* Discovery made by members of the Division of Forest Pathology (Bureau of Plant Industry)

TABLE NO. 5

PINYON RUST INFECTIONS
FOUND IN SOUTHERN OREGON AND NORTHERN CALIFORNIA
DURING 1937

State	County	Locality	Twp.	R.	Sec.	Host Infected	Remarks
			Mt. Diablo Meridian				
California	Siskiyou	Near Bartle	40N	2E	31	R. cruentum	Discovery made by Division of Forest Pathology
	Tehama	Battle Creek	29N	4E	17 19	R. roezli	Four bushes averaging 75 infected leaves each
	Tuolumne	Cow Creek BRC Camp	5N	18E	34	R. roezli	
			Willamette Meridian				
Oregon	Jackson	Butte Falls	35S	2E	11	R. sanguineum	Two bushes infected
		Chinquapin Mountain	39S	4E	22	R. sanguineum	One bush infected
		Pinehurst	40S	3E	3 4 10	R. klamathense	Seven infected bushes distributed for one mile along Keene Creek

PART VI

DEVELOPMENTAL WORK IN METHODS OF RIBES ERADICATION AND PROGRESS OF RIBES ECOLOGY WORK IN THE SUGAR PINE REGION FOR 1937

By

H. R. Offord, Pathologist, C. R. Quick, Assistant Pathologist,
and L. P. Winslow, Agent

INTRODUCTION

At the beginning of the 1937 calendar year responsibility for the conduct of blister rust control in the far western states was assigned to two regional leaders, W. V. Benedict at Oakland, California, and H. E. Swanson at Spokane, Washington. The former leader was to direct work for the sugar pine region (California and Oregon) and the latter for the northwestern region (Washington, Idaho, Montana, Wyoming, and Colorado). The development of special methods of Ribes eradication, the continuation of Ribes ecology work, and the testing and improving of equipment for both regions were combined into a special activity under the supervision of H. R. Offord at Berkeley, California. Although the methods work remained on the same territorial basis as prevailed prior to the division of the western work, it was understood that work undertaken in the separate regions would be planned and executed in close cooperation with the respective regional leaders. Conforming to the intent of the reorganization scheme, several changes were made in the assignment of responsibilities to the personnel of the methods project.

Ecological studies for the sugar pine region were assigned to C. R. Quick, and the development of chemical methods to L. P. Winslow, who was appointed September 1 to fill the vacancy caused by the resignation of G. R. Van Atta. The development of mechanical methods of Ribes eradication and the testing and improvement of equipment, which have for many years been handled out of the Spokane office by J. F. Breakey, were nominally catalogued as activities of the methods project, with the understanding that Breakey would continue to work under the immediate direction of the leader for the northwestern region. Miss Ryan was transferred from the Oakland office to the Berkeley office to take care of stenographic and clerical work. All fiscal matters pertaining to the management of the methods project were to be handled through the Oakland office. The following people are now being paid out of regular funds allotted to the methods project: At Berkeley, California - H. R. Offord, C. R. Quick, Catherine Ryan, and L. P. Winslow. At Spokane, Washington - J. F. Breakey and V. D. Moss.

For the first time, the annual report on methods work will be presented separately for the two regions. This report covers methods improvement and Ribes ecology work undertaken in the sugar pine region for the calendar year of 1937.

RESULTS OF 1936 FIELD WORK

Decapitation Tests

On July 7, Offord and Quick checked the 1936 decapitation plots on *Ribes roezli* and *R. viscosissimum* in the Punch Bowl, Stanislaus National Forest. Results, as shown in Table No. 1, confirm the high effectiveness of dry sodium thiocyanate when applied directly to decapitated crowns. *Ribes roezli* and *R. viscosissimum* appeared to be equally susceptible to this chemical under the conditions of the test. Thus, dry sodium thiocyanate can be used for the eradication of occasional troublesome *R. roezli* and *R. viscosissimum*.

On the two plots shown in Table No. 1, all medium and small Ribes were grubbed according to regular methods. The percentages of 6.0 and 6.6 for bushes missed in the grubbing work seem to be high, although data for grubbing given in Table No. 2 for the extensive methods tests conducted at Thompson and Fahey Meadows, show that missed bushes and sprouting crowns amounted to 3.0 and 4.8 per cent of the original Ribes population. These figures are of interest chiefly because they indicate the efficiency of our regular methods in one working of a heavy concentration of Ribes. Records from the checking organization do not necessarily show this because areas of heavily populated Ribes are usually worked more than once before being turned over for checking.

Because of the limited personnel available for methods work during the field season of 1937, no plot work was done in Oregon. Wessela supervised the testing of an aqueous Atlacide spray (1.5 lbs. per gallon of water) on *R. bracteosum*. In this work 500 pounds of Atlacide were applied to *R. bracteosum* on about a 5-acre area located in the Prairie Creek drainage basin, Rogue River National Forest. Several clumps of *R. binominatum* growing on the area were sprayed with generous dosages of Atlacide. Considerable interest is attached to this work on *R. binominatum* because no previous test of Atlacide has been made on the species.

TABLE NO. 1

RESULTS OF 1936 DECAPITATION TESTS ON RIBES ROEZLI AND R. VISCOSISSIMUM, PUNCH BOWL AREA, STANISLAUS NATIONAL FOREST, CALIFORNIA

Plot No.	Date Treated	Number of Bushes Decapitated	Number of Bushes Grubbed	Per cent Bushes Killed by Chemical Treatment	Per cent Bushes Missed in Grubbing Work
1*	5/26	245	465	98	6.0
2**	5/25	74	715	99	6.6

* Decapitated crowns each treated with 1 ounce of dry sodium thiocyanate (American Cyanamid Co. weedkiller).

** Decapitated crowns treated with 2 ounces of dry sodium thiocyanate.

Diesel Oil Methods Tests

Diesel oil methods plots on the Stanislaus and the Sierra National Forests established in August and September 1936, by Van Atta, were checked by Offord and Quick during the period July 8-13. One hundred per cent of the ground area within each plot was examined for resprouts, missed bushes, and seedlings. A summary of the data for all plots is given in Table No. 2.

Three important facts stand out among the data presented in Table No. 2: (1) The total feet of live stem and the number of bushes per acre remaining on the area after one working by either grubbing or a combination of grubbing and oiling, are too high to pass checking standards. Even with competent labor it seems unlikely that areas of high Ribes concentrations, such as those chosen for chemical work, can be reduced to live stem standards acceptable for control work in one working. This observation is borne out by the records of eradication crews using regular grubbing methods. On the score of general effectiveness of the method, therefore, the combined grubbing and oiling procedure should not be rated unsatisfactory merely because the method failed to eradicate all the Ribes. (2) The percentage of crowns which sprouted following treatment with Diesel oil (column 9 of Table No. 2) ranged from 0.4-1.5. These results are considered to be satisfactory from the standpoint of chemical kill, though they should be improved as crews become more experienced. (3) The number of crowns decapitated but not oiled, that is, missed by the oiler, varied from 0.3-7.5 per cent. Missed crowns, therefore, constitute a more significant hazard to the efficiency of the oiling method than do the surviving crowns. Incidentally, all the missed crowns were sprouting, as might be expected, because decapitation was made well above the crown level. The missing of decapitated crowns can be charged in part to the procedure followed, and in part to the inexperience of the crews. On the Sierra National Forest, the average experience expressed in number of 6-hour man days of all workers with the oiling method was: For Plot 1a, 0.946; Plot 1b, 1.523; Plot 1c, 2.353 (6-hour man days). Also, to evaluate the 1936 methods data fairly, it must be noted that the labor turned over to Van Atta was never of the better than average or experienced type.

No attempt was made to mark decapitated crowns for the oiler, although each cutter was supposed to expose the crown as much as possible, and at the same time call the attention of the oiler to the cut-off bush. Inasmuch as the crews were working in heavy Ribes concentrations, the ground was stirred over very thoroughly in the grubbing work so that some of the crowns would become partially covered with dirt. A little more experience with the method, combined with a marking scheme, would undoubtedly reduce the number of missed crowns to a more reasonable figure. The system of marking crowns by means of oilers' waste, as suggested by C. H. Johnson, should be effective, inexpensive, and convenient.

The auxiliary oil method is recommended for the eradication of R. roezli where these bushes occur in great numbers Photograph W2179, or where they are rooted in rocky soil Photograph W2238. The method is especially adapted to accessible areas such as old logging camp sites, abandoned railway spurs Photograph W2240, and roadsides.

TABLE NO. 2

SUMMARY OF METHODS DATA TAKEN IN 1937 FROM TEST AREAS ESTABLISHED ON STANISLAUS AND SIERRA NATIONAL FORESTS IN 1936

Plot Number and Location *	Eradication Method Used	Number Ribes Per Acre	Per Cent Large Bushes	Man Minutes to Grub 100 Small Plants	Man Minutes to Destroy 100 Large Plants	Gallons Oil Used Per 100 Large Plants	Data on Per Acre Basis						
							Live Crowns On Area in 1937		Crowns Missed (i.e. not oiled)		Bushes Present On Area in 1937 **		Feet Live Stem on Area in 1937
							No.	Per Cent	No.	Per Cent	No.	Per Cent	
Stanislaus Nat'l. Forest													
Thompson Meadow													
1a	Grubbing	8,836	19.18	77	245	-	24.2	1.4	-	-	142	1.6	296
1b	Oiling & Grubbing	4,922	15.87	75	257	4.70	6.6	0.8	14.8	1.9	81	1.6	275
Fahey Meadow													
2a	Grubbing	2,517	21.08	50	576	-	0	0	-	-	120	4.8	286
2b	Oiling & Grubbing	10,754	36.14	45	209	5.85	15.2	0.4	13.2	0.3	114	1.1	350
Sierra National Forest													
1a	Oiling & Grubbing	4,029	13.12	64	301	7.36	2.2	0.4	29.2	5.5	101	2.5	329
1b	do.	1,893	21.29	50	287	4.54	4.0	1.0	29.7	7.4	91	4.8	270
1c	do.	2,988	17.92	68	205	3.94	7.8	1.5	40.0	7.5	175	5.8	447
1d	Grubbing	3,010	16.30	60	304	-	Data from regular checking records				25	-	130

* Stanislaus Nat'l. Forest
Thompson Meadow - - Plot 1a . . . . . 1.2 acre
Plot 1b . . . . . 7.1 acres
Fahey Meadow - - - Plot 2a . . . . . 0.375 acre
Plot 2b . . . . . 0.985 acre

* Sierra Nat'l. Forest
Chowchilla Mt. - - Plot 1a . . . . . 2.33 acres
Plot 1b . . . . . 1.75 acre
Plot 1c . . . . . 0.90 acre
Plot 1d . . . . . Control area worked by regular methods- 20.25 acres

** These are all intact bushes and represent everything except seedlings of current year origin. Figures given in this column are exclusive of those shown under live and missed crowns.

W 2179 Thirty R. roezli crowns are in the area indicated by the string. These crowns were treated with Diesel oil in 1936. All were dead in 1937. Stanislaus N. F., Calif.

W 2174. Showing the effectiveness of a Diesel oil spray on 2-year-old R. roezli seedlings. Note pencil for size comparison. Stanislaus N. F., Calif.

W 2240. Abondoned logging right-of-woy, Sierro N. F., Colif. This old roodbed represents difficult working conditions becouse of rock bollost. Note the four R. roezli bushes olong center line of the picture.

W 2238. Showing rock-bound R. roezli crowns along obondoned logging right-of-woy. As shown by these deod crowns, Diesel oil is fully effective under rocky conditions.

FIELD TESTS FOR 1937

Decapitation Tests on Ribes nevadense

On July 31, Offord and Pancoast established one chemical plot in the vicinity of Mt. Raymond Mill, and on October 14, 15, and 16, Winslow, with the assistance of Howell and Lewis, established three more chemical plots in the same area. Data for all plots are given in Table No. 3. The October work was done after a heavy rain.

The purpose of this work was to determine the toxicity of: (1) an aqueous solution of sodium ethyl xanthate, (2) Diesel oil, and (3) a mixture of Diesel oil and furfural saturated with ammonium thiocyanate. Data on the dosage necessary for an effective kill will also be obtained from these plots.

TABLE NO. 3

DECAPITATION TESTS ON RIBES NEVADENSE, RAYMOND MILL AREA, SIERRA NATIONAL FOREST, CALIFORNIA, 1937

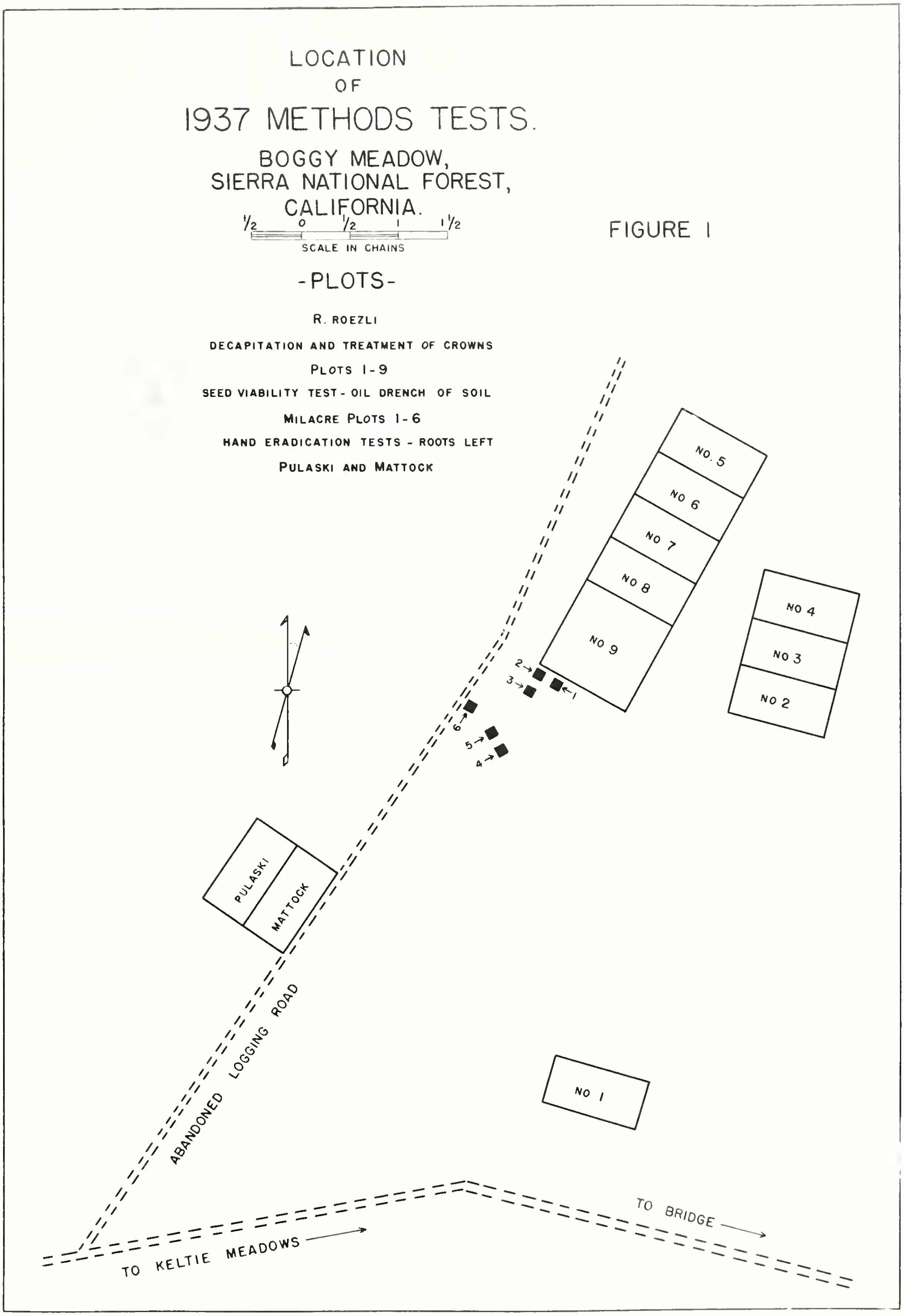
Plot No.	Date of Treatment*	Chemical Used	Number of Bushes Treated Classified on Basis of Dosages in Fluid Ounces										Total Number Bushes Treated
			1	2	3	4	5	6	7	8	10	17	
1**	7/31	Sodium ethyl xanthate (2 lbs.per gal.H_2O)		28	1	9		4					42
2	10/14,15, 16	Diesel oil (27° Bé +)		40	28	21	7	1			2	1	100
3	10/15,16	Diesel oil (5 parts) and furfural (1 part) saturated with ammonium thiocyanate	16	65	14	1	1	1		1		1	100
4	10/15,16	Diesel oil (7 parts) and furfural (1 part) saturated with ammonium thiocyanate	8	45	17	8	5	11	1	2	3		100

* The most convenient tool for decapitation of R. nevadense in rocky soil was found to be a pair of long-handled pruning shears.

** Plot No. 1 tests include six intact R. nevadense, each bush treated with 8 fluid ounces of sodium ethyl xanthate. On the same plot nine controls were decapitated; no chemical used.

Decapitation Tests on Ribes roezli

On July 30 and August 4, 5, and 6, Offord and Pancoast established four chemical plots at Boggy Meadows, Sierra National Forest, and on September 8 and 26, October 2 and 12, Winslow, with two assistants, established five more plots in the same area. The object and treatment were similar to the tests previously described for *R. nevadense*. Location and size of the plots are shown in Figure 1, and plot treatments are summarized in Table No. 4. Conditions typical of the Boggy Meadows area are shown by Photographs W2334 and W2335.


LOCATION
OF
1937 METHODS TESTS.
BOGGY MEADOW,
SIERRA NATIONAL FOREST,
CALIFORNIA.
1/2 0 1/2 1 1 1/2
SCALE IN CHAINS
FIGURE I
-PLOTS-
R. ROEZLI
DECAPITATION AND TREATMENT OF CROWNS
PLOTS 1-9
SEED VIABILITY TEST - OIL DRENCH OF SOIL
MILACRE PLOTS 1-6
HAND ERADICATION TESTS - ROOTS LEFT
PULASKI AND MATTOCK
NO. 5
NO 6
NO 7
NO 8
NO 9
NO 4
NO 3
NO 2
NO 1
1
2
3
4
5
6
PULASKI
MATTOCK
ABANDONED LOGGING ROAD
TO KELTIE MEADOWS
TO BRIDGE

W 2334 and W 2335. Two views of the area at Baggy Meadow, Sierra N. F., Calif., where the 1937 chemical plots were established. All brushy ground cover in these pictures is R. roezli. Over several acres the R. roezli covered nearly 100 percent of the ground area. Bushes were large, vigorous, and bore abundant fruit.

TABLE NO. 4

DECAPITATION TESTS ON RIBES ROEZLI AT BOGGY MEADOWS, SIERRA NATIONAL FOREST, CALIFORNIA, 1937.

Plot No.	Date of Treatment	Chemical Used	Number of Bushes Treated Classified on Basis of Dosages in Fluid Ounces						Total Number Bushes Treated*
			1	2	3	4	5	6	
1	7/30	Sodium ethyl xanthate (2 lbs.per gal. H_2O)		41		1			42
2	8/4	Diesel oil (5 parts) and furfural (1 part) saturated with ammonium thiocyanate		44	1	2			47
3	8/5	Diesel oil (27° Bé +)		42	3	3	1		49
4	8/6	Diesel oil (7 parts) and furfural (1 part) saturated with ammonium thiocyanate		62					62
5	9/8	Sodium ethyl xanthate (1 lb.per gal. H_2O)		79	11	7		1	98
6	9/26 10/2	Diesel oil (27° Bé +)		98		2			100
7	10/2	Diesel oil (5 parts) and furfural (1 part) saturated with ammonium thiocyanate		93		7			100
8	10/12	Diesel oil (7 parts) and furfural (1 part) saturated with ammonium thiocyanate	18	75	5	2			100
9	10/12	Diesel oil (10 parts) and furfural (1 part) saturated with ammonium thiocyanate	42	53	1	3	1		100

* On plots 1, 2, 3, and 4, a number of intact bushes were treated with varying amounts of chemical applied as a soil drench about the crown. On the same plots twenty-four controls were decapitated. Data for these bushes are not summarized in this table.

Trial of Low Decapitation of Ribes roezli Without Chemical Treatment of Roots

Studies previously undertaken have shown that it is unnecessary to remove all root ends of R. roezli to accomplish effective eradication. The eradication procedure suggested by this information has not been adapted to WPA labor during recent years because of the difficulties of training the workers to distinguish between crown tissue and true roots. With the thought in mind that a better class of labor might be available in the future, F. A. Patty suggested that a trial be made of low decapitation without chemical treatment. On October 18, Winslow and two assistants established two small-scale grubbing plots at Boggy Meadows. Data for these tests are given in Table No. 5.

Both Pulaskis and the heavy pick mattocks were used; the roots were cut off four to six inches from the crown, and left in the ground. No chemical was used to treat these root ends, and no attempt was made to expose the roots beyond the point where they were broken off.

TABLE NO. 5

TRIAL OF LOW DECAPITATION OF RIBES ROEZLI WITHOUT CHEMICAL TREATMENT OF ROOTS, SIERRA NATIONAL FOREST, CALIFORNIA, 1937

Tool Used	Size of Plot	Number of Small Bushes Removed	Number of Large Bushes Removed	Man Hours Expended	Remarks
Pick Mattock	33'x66'	117	85	2.66	Comparatively clear area.
Pulaski	33'x66'	122	23	2.66	Many down logs from logging.

Effect of Diesel Oil on the Viability of Ribes Seed

At various times during the 1937 field season, the methods organization was asked the question, "What effect does Diesel oil have upon the viability of Ribes seed stored in the soil?" The following steps were taken to obtain preliminary data on this subject.

On October 18, Winslow laid out six milacre plots at Boggy Meadows. All Ribes were clipped at ground level with pruning shears; bush stalks were then removed, care being taken to disturb the soil as little as possible. The area was densely populated with mature R. roezli bushes which had fruited heavily in 1937 and fruit husks of current year origin were abundant on the soil surface.

The plots were sprayed with various amounts of Diesel oil. Soil samples were taken from designated small segments of each plot twenty-four hours after spraying. Ribes seed will be subsequently extracted from these soil samples and the viability of seed established by greenhouse test. The remainder of each plot was left undisturbed for a check on natural germination in 1938. Plot data are shown in Table No. 6; location of the plots is given in Figure 1.

TABLE NO. 6

TESTS OF DIESEL OIL ON VIABILITY OF RIBES ROEZLI SEED, BOGGY MEADOWS, SIERRA NATIONAL FOREST, CALIFORNIA, 1937

Plot Number	Dosage Applied In Gallons	Equivalent Dosage In Gallons On Acreage Basis
1	0.5	500
2	1.0	1,000
3	1.5	1,500
4	2.0	2,000
5	3.0	3,000
6	5.0	5,000

Methods Tests on Ribes roezli Seedlings, Sierra National Forest

Results of the 1936 Diesel oil tests on *R. roezli* seedlings indicated that the oil was 100 per cent effective on all treated bushes (see Photo.-W2174). These plots were established by Van Atta in August and September at Cow Creek, Stanislaus National Forest and at Camp 2, Sierra National Forest. An exact check of the area was difficult, however, because of: (1) the small size of the treated bushes, (2) weathering and disintegration of the bushes during the winter intervening between treatment and check, and (3) disturbance of the area by the trampling of grazing animals during the summer months.

The 1937 tests were planned to give additional data on the effectiveness and practicability of oil treatment, especially: (1) the comparative cost and effectiveness of eradication by Diesel oil and by various special-purpose tools, (2) the testing of various types of spray equipment for the application of Diesel oil, (3) the relationship between dosage of oil and effectiveness under the varying conditions of field work.

In 1937, it was found difficult to obtain the old type of Diesel oil which has been used in the past for experimental work. Five hundred gallons of the oil used during 1937 were of the "light Diesel" type, an oil which is considered to be partly lacking in the toxic properties desired. Results of the 1938 check should indicate the relative toxicities of the two grades of oil.

The class of labor used for the 1937 experimental work was, as a whole, of higher caliber than that used in 1936. Two of the men who were employed for the major part of the time were excellent workers.

Location of Plots. The seedling plots were established at various times during the summer and fall by Offord and Winslow with the assistance of laborers from the Bureau eradication camp on Miami Creek, Sierra National Forest, California. The Camp 2 plot area faces northeast at an altitude of 6,500 feet on Chowchilla Mountain, and lies just northeast of Signal Peak in Section 34, T. 4 S., R. 20 E., and Sections 1 and 2, T. 5 S., R. 20 E., Mt. Diablo Base line and Meridian. The location and the size of all plots in the Camp 2 area are shown in Figure 2.

An area of *R. roezli* seedlings near Bear Wallow camp about two miles north of Camp 2 was also chosen for Diesel oil methods tests.

Methods Used. As a practical means of instructing spray crews in the amount of oil to use on seedlings, the following arbitrary standards were established: (a) Light dosage: Application of oil to the base of the bush only. (For larger seedlings this was equivalent to treating a circular area of ground about six inches in diameter.) (b) Medium dosage: Full coverage of all leaves, stems, and incidental treatment of soil about base of plant. (c) Heavy dosage: Full coverage of all leaves, stems, and heavy application to soil about the base of the plant.

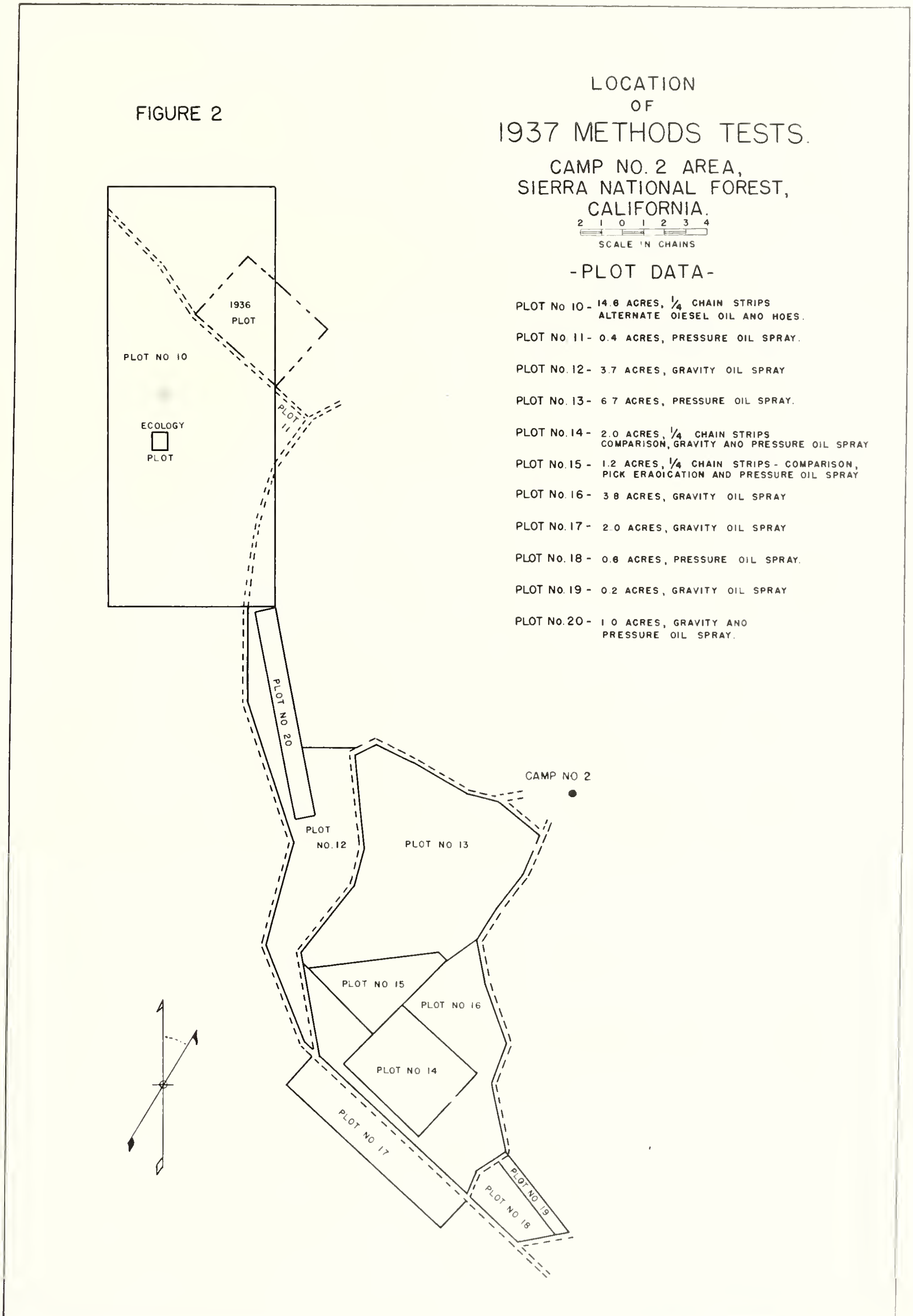


FIGURE 2
LOCATION
OF
1937 METHODS TESTS.
CAMP NO. 2 AREA,
SIERRA NATIONAL FOREST,
CALIFORNIA.
2 1 0 1 2 3 4
SCALE IN CHAINS
-PLOT DATA-
PLOT No 10 - 14.6 ACRES, 1/4 CHAIN STRIPS ALTERNATE DIESEL OIL AND HOES.
PLOT No 11 - 0.4 ACRES, PRESSURE OIL SPRAY.
PLOT No. 12 - 3.7 ACRES, GRAVITY OIL SPRAY
PLOT No. 13 - 6.7 ACRES, PRESSURE OIL SPRAY.
PLOT No. 14 - 2.0 ACRES, 1/4 CHAIN STRIPS COMPARISON, GRAVITY AND PRESSURE OIL SPRAY
PLOT No. 15 - 1.2 ACRES, 1/4 CHAIN STRIPS - COMPARISON, PICK ERADICATION AND PRESSURE OIL SPRAY
PLOT No. 16 - 3.8 ACRES, GRAVITY OIL SPRAY
PLOT No. 17 - 2.0 ACRES, GRAVITY OIL SPRAY
PLOT No. 18 - 0.6 ACRES, PRESSURE OIL SPRAY.
PLOT No. 19 - 0.2 ACRES, GRAVITY OIL SPRAY
PLOT No. 20 - 1.0 ACRES, GRAVITY AND PRESSURE OIL SPRAY.
1936 PLOT
PLOT NO 10
ECOLOGY PLOT
PLOT 11
PLOT NO 20
PLOT NO. 12
PLOT NO 13
CAMP NO 2
PLOT NO 15
PLOT NO 16
PLOT NO 14
PLOT NO 17
PLOT NO 18
PLOT NO 19

It is difficult to correlate these field treatments with definite dosages per acre such as were shown in Table No. 6. The approximate relationship, however, is estimated as follows:

Light dosage	275 gallons per acre dosage rate; or 15-20 gallons per acre actual.
Medium dosage	500 gallons per acre dosage rate; or 30-40 gallons per acre actual.
Heavy dosage	1,500 gallons per acre dosage rate; or 50-150 gallons per acre actual.

In applying oil to a bush, the amount reaching the soil varies from a soil drench contiguous to the crown, to a light sprinkle at the outer edges of the area shaded by the bush. With small seedlings of current year origin, the entire ground area shaded by each plant is covered with oil. On the basis of the dosage standards just described, this is equivalent, in the case of all small seedlings, to a medium or heavy dosage.

Observations made several weeks after the application of the oil seemed to indicate that the light dosage of oil was insufficient for an effective kill; the ends of the branches not covered by the oil remained green. Where entire seedlings had been sprayed with oil, they appeared to be dead after a week or ten days. The final outcome of these treatments, of course, cannot be determined until the spring of 1938.

As a rule, the seedlings occurred in densely populated patches of about one-quarter acre in size, with scattered bushes over the intervening ground. These concentrations occurred at the rate of approximately one for each three acres. Seedling counts made September 6 to 9, 1937, showed a maximum density of 145,000 Ribes per acre, and estimations of the 36 acres covered by the plots indicated, with reasonable accuracy, an average figure of from 10,000 to 16,000 seedlings per acre. These figures, however, included many seedlings that will not survive.

One of the important questions relating to effective eradication practice is: Should seed in the soil be encouraged to sprout and the seedlings destroyed early in the eradication program, thus hastening the elimination of seed from the soil, or should the area be handled so as to hold back seed germination? Thus far it has not been possible to make a logical choice between these two alternatives largely because of insufficient data on the longevity of Ribes seed and the survival of seedlings under field conditions.

As a means of making comparisons of various eradication methods, and to facilitate comparative observations on the seedling problem, one-quarter chain strips were worked alternately by the oiling method and by one of the several methods of grubbing. A number of plots were laid out and worked in this manner. Data for each plot are given under captions of: description, objective, methods used, and remarks.

Plot 10

Description: 14.55 acres were laid off in one-quarter chain strips. Heavy hoes and oil sprays were then used on alternate strips. The plot area was large enough to embrace several dense patches of seedlings and several brush areas. The soil was rocky in places, consisting of eradicated Ribes and logging slash. Debris was present over part of the plot.

Objective: (1) To determine the advisability of using heavy garden hoes or cotton hoes in seedling eradication, (2) to compare hoe work with oil work, and (3) to provide an area for future observation where the soil had been thoroughly disturbed.

Methods used: Alternate strips were worked with hoes and oil sprayers. Portions of the plot heaviest in Ribes were oiled either with gravity sprayers or pressure sprayers. The gravity sprayer consisted of a 5-gallon tank attached to a packboard and equipped with short hose, self-closing valve, iron-pipe extension, and a rose-type spray nozzle. The pressure sprayer used was the 3-gallon orchard-type, equipped with a Vermorel nozzle.

Two types of hoes were used: (1) a light hoe-mattock with detachable handle, large blade 3-1/2 inches wide, small blade 1-3/4 inch wide, and (2) heavy cotton or hazel-type hoe with detachable handle and 7-inch blade.

Remarks: Data for Plot 10 are shown in Tables Nos. 7 and 9. Both hoes were effective in soil free from rock, brush, and sticks, the hoe-mattock being the more effective of the two among rocks. Where the soil was very rocky, the oil spray was more effective than the grubbing methods; where seedlings had germinated in both dead and living brush, they could be reached more easily with the spray than with the hoe. The latter may be practicable in open mountain meadows where seedlings are dense and the soil free from obstruction of all kinds. Oil sprayers appear to be better adapted to general all round use on seedling areas than any of the grubbing equipment tested.

Plots 11-13, and 16-19

These plots are largely made up of the odd shaped areas bounded by roads and other plots as shown in Figure 2, and were worked as part of the practical field test in the eradication of seedlings from the area. Data are given in Table No. 7.

TABLE NO. 7

DIESEL OIL METHODS TESTS ON RIBES ROEZLI SEEDLINGS, CAMP 2 AREA, SIERRA NATIONAL FOREST, CALIFORNIA, 1937

Plot No.	Date Worked	Acres Worked		Man Hours		Total Gallons Oil Used Per Plot	Gallons Oil Used Per Acre
		Chemical	Hand Eradi- cation	Chemical	Hand Eradi- cation		
10	Sept. 14-22	7.3	7.25	60.0	88	148.5	20.3
11	Sept. 23	0.4		3.0		8.5	21.0
12	Sept. 23-24	3.7		33.0		138.0	37.3
13	Sept. 23-Oct.7	6.7		41.5		104.5	15.6
14	Sept. 29-30	2.0		17.3		90.0	45.0
15	Oct. 1-5	0.6	0.6	7.0	.27	26.0	43.3
16	Oct. 5-7	3.8		28.5		128.0	33.7
17	Oct. 8	2.0		15.0		72.0	36.0
18	Oct. 8-9	0.8		4.5		22.0	27.5
19	Oct. 9	0.2		2.0		19.5	97.5
20	Aug. 11 and 12	1.0		16.5		123.4	123.4

Plot 14

Description: Two acres laid off in one-quarter chain strips and worked with both gravity and pressure sprayers.

Objective: To determine the differences between the two methods as to (1) speed of work, (2) consumption of oil, and (3) effectiveness of kill.

Method: A medium dosage, or complete coverage of the bush, was applied to facilitate comparison of the two methods. Table No. 8 shows these data for Plots 10 and 14.

TABLE NO. 8

COMPARISON OF DATA FOR OIL TREATMENT OF RIBES ROEZLI SEEDLINGS BY PRESSURE AND GRAVITY SPRAYS

Plot No.	Method	Date Worked	Acres Worked	Total Man Hours	Total Gallons Oil Used	Man Hours Per Acre	Gallons Oil Per Acre	Dosage
10*	Pressure	Sept. 14-20	1.50	19.5	50	13.0	33	Light to medium
	Gravity	Sept. 14-17	1.35	23.5	57	16.0	42	do
14	Pressure	Sept. 29-30	1.00	7.5	26	7.5	26	Medium
	Gravity	Sept. 29-30	1.00	10.0	64	10.0	64	do

* Data taken from a portion of Plot 10 heavy in seedlings.

Remarks: The work on Plot 10 was done with a poor type of inexperienced labor. Plot 14 was worked later with experienced, willing workers. The data indicated pressure to be the better method. No conclusions can be made relative to effectiveness of kill until the spring check in 1938.

Plot 15

Description: 1.2 acres, triangular in shape, laid off in one-quarter chain strips. The soil was very rocky, with considerable white-thorn brush present.

Objective: (1) To compare the speed of ground coverage by oil sprayers and light picks, the pick work to be supplemented by handpulling; (2) to establish the relative effectiveness of kill of the two methods; and (3) to provide an area of disturbed soil for future study.

Method: Alternate strips were worked by means of picks and the intervening strips by means of pressure oil sprayer. A heavy dosage of oil was applied. Data, including those of Plot 10 for comparison, are shown in Table No. 9.

The pick employed was of the small, "camp boss" type, manufactured in the Camp 8 blacksmith shop, and fitted with a 3-foot sledge hammer handle, the mattock portion of the pick being about 1-1/2 inch wide.

TABLE NO. 9

COMPARATIVE WORKING SPEEDS OF ERADICATING RIBES ROEZLI SEEDLINGS BY OIL AND BY GRUBBING TOOLS

Plot No.	Method	Date Worked	Acres Worked	Total Man Hours	Total Gallons Oil Used	Man Hours Per Acre	Gallons Oil Per Acre
10	Oil	Sept. 14-22	7.30	60	148.5	8.22	20.34
	Hoes	Sept. 14-22	7.25	88	-	12.13	-
15	Oil	Oct. 1-5	0.60	7	26	11.66	43.3
	Picks	Oct. 1-5	0.60	27	-	45.00	-

Plot 20

Description: One acre (1 chain by 10 chains) divided into ten 1-chain stations. Ribes population fairly heavy and of even distribution. A comparatively dry site.

Objective: (1) To establish the effect of various dosages of oil when applied by different methods; (2) to give a partial time study of the various methods.

Method: A member of the crew was assigned to a sub-plot, and instructed in its treatment. Plot data were taken by a recorder. All Ribes were treated, but only those bushes of approximately 2-1/2 inches in height and larger, were counted. Plot data are given in Table No. 10.

TABLE NO. 10.

SUMMARY OF TREATMENT DATA FOR PLOT 20, CAMP 2 AREA,
SIERRA NATIONAL FOREST, CALIFORNIA.

Sub-Plot[1] No.	Date of Treat-ment	Method of Treatment	No. Men in Crew	Total Man Minutes for Treating Plot	Number of R. roezli on Plot	Number of R. roezli Per Acre[5]	Man Days Per Acre (8-Hour Day)	Gallons Diesel Oil Used on Plot	Gallons Diesel Oil Per Acre	Number of R. roezli Covered Per Gallon Oil	Number of R. roezli Oiled Per Man Minute
0-1	Aug. 11	Spray[2]	2	78	493	4,930	1.6	8	80.0	61.5	6.3
1-2	Aug. 11	Drench[3]	1	38	507	5,070	0.8	5-1/8	51.2	99.1	13.3
2-3	Aug. 11	Spray[2]	2	70	325	3,250	1.5	7-1/4	71.2	44.9	4.6
3-4	Aug. 11	Drench[3]	1	89	673	6,730	1.8	7-3/4	77.7	86.8	7.6
4-5	Aug. 11	Spray[2]	2	92	588	5,880	1.9	15	150.0	39.2	6.4
5-6	Aug. 12	Drench[3]	1	102	894	8,940	2.1	11-1/4	112.5	79.4	8.8
6-7	Aug. 12	Drench[3]	1	203	1,046	10,460	4.2	24	240.0	43.6	5.1
7-8	Aug. 12	Drench[3]	1	206	1,631	16,310	4.3	19	190.0	85.8	7.9
8-9	Aug. 12	Spray[4]	1	245	1,405	14,050	5.1	12-1/4	122.5	114.6	5.7
9-10	Aug. 12	Drench[3]	2	100	832	8,320	2.1	13-3/4	137.5	60.5	8.3

[1]Area of each sub-plot = 1 sq. chain.
[2]Applied with 5-gallon knapsack tank equipped with trombone pump and Vermorel nozzle.
[3]Applied with 5-gallon knapsack tank equipped with trigger shut-off valve and rose-type nozzle head.
[4]Applied with 3-gallon orchard-type compressed air sprayer equipped with Vermorel nozzle.
[5]Average number of _R. roezli_ bushes per acre over 2-1/2" in height = 8,394.

Average number of bushes per gallon of oil for entire plot
Spray[2] = 48.5; drench[3] = 75.8; spray[4] = 114.6
Average number of bushes per man minute for entire plot

Spray[2] = 5.4
Drench[3] = 8.5
Spray[4] = 5.7

Plots 1-8, Bear Wallow

The area treated was 2.5 acres in size; the soil was rocky, and seedling growth moderately abundant. Numerous sprouted crowns of old bushes were to be found as the area was part of the first 1935 working done with totally inexperienced labor.

The objectives of the work were to test a large pressure spray tank (described later), to establish small dosage plots, and to provide additional data on the heavy application of oil to both seedlings and sprouted crowns. Treatment data are shown in Table No. 11.

TABLE NO. 11

SUMMARY OF 1937 DIESEL OIL TESTS AT BEAR WALLOW CAMP AREA
SIERRA NATIONAL FOREST, CALIFORNIA

Plot No.*	Date Treated	Acres Treated	Dosage	Method of Application	Total Gallons of Oil Used Per Plot	Gallons of Oil Used Per Acre
1	Oct. 9	0.05	Heavy	Pressure	2.5	50.0
2	do	0.05	do	Gravity	3.5	70.0
3	do	0.05	Medium	Pressure	1.0	20.0
4	do	0.05	do	Gravity	2.5	50.0
5	do	0.05	Light	Pressure	1.0	20.0
6	do	0.05	do	Gravity	2.0	40.0
7	Oct. 9,11	1.40	Heavy	Pressure	66.5**	47.5
8	do	0.80	do	Gravity	36.0	45.0

* Time studies were not made because of the small size of the sub-plots. Each plot was approximately 1/2 square chain.

** Forty gallons of the 66.5 gallon amount were applied by means of a barrel pressure rig.

Motor Transportation of Seedling Sprayer Unit

In the logged-off areas of the Sierra National Forest there is, as a rule, a strip of varying width along the roads and logging skidways which produces an abundant Ribes seedling population following the initial hand eradication work. Much of this sort of territory could readily be worked from a motor-driven pressure tank equipped with proper hose and nozzles.

A simple field test was made as follows: A heavy welded gasoline drum was employed as both oil container and pressure tank, a regular auto tire valve stem being soldered into the larger bung of the barrel. The smaller bunghole of the barrel was fitted with a Crane gate valve and hose connection. About 20 feet of pressure hose with 3-foot extension rod, self-closing valve, and Vermorel nozzle were attached. The unit was loaded into a Chevrolet 1/2-ton pickup. Adequate pressure in the oil drum was obtained by means of a diaphragm tire pump screwed into a spark plug hole of the pickup engine. A pressure of 29-1/2 pounds was employed on the first trial and excellent vaporization of the oil obtained. Later tests indicated that

pressures of from 12 to 20 pounds were sufficient for effective spraying. Spraying was reasonably effective at a pressure as low as seven pounds.

The initial cost of such a unit is very low and it is readily assembled, and easy to operate. With 50 to 60 feet of hose, such a unit should be very effective along roads and on level areas. Considerable time is saved owing to the large capacity tank which eliminates the time taken for frequent refilling trips.

LABORATORY AND GREENHOUSE WORK, NOVEMBER 1936 to APRIL 1937

Because of Van Atta's resignation from methods work in January 1937, and the temporary termination of work at the Moscow laboratory, the amount of investigative work completed was very small. Laboratory and greenhouse work undertaken at Berkeley, California, during the winter of 1936-1937 included: (a) testing of new Ribicides (Offord), (b) continuation of Ribes seed germination tests (Quick), (c) testing of the effect of Diesel oil, sodium chlorate, sodium chlorate plus borax, and borax alone, on the viability of Ribes seeds (Offord).

A new Ribicide consisting of a mixture of Diesel oil and furfural saturated with ammonium thiocyanate was tested by application to greenhouse plants. By comparison with Diesel oil for work under wet soil conditions, the new formula appeared so favorable that an application was filed for a public service patent on the mixture.

The results of seed germination tests are necessarily about one year behind the time at which cultures are prepared. Thus, the report prepared by Quick last winter on his seed germination work (Serial No. 92) covers the work done during 1935 and 1936. Reference should be made to this report for details and a summary of the work done.

Soil sterilization tests with respect to Ribes seed viability are incomplete and no data are presented now.

Special reports prepared and filed during the winter of 1936-37:

Serial No. 84
The use of chemicals to aid in the burning of brush piles. H. R. Offord and R. P. d'Urbal.

Serial No. 85
Field trials of eradication methods performed in the Stanislaus National Forest from June 16 to August 3, 1936. G. R. Van Atta.

Serial No. 86
Field trials of eradication methods performed in the Sierra National Forest from September 17 to September 26, 1936. (A progress report.) G. R. Van Atta.

Serial No. 87
Field trials of eradication methods performed in California during 1936. (A summary.) G. R. Van Atta.

Serial No. 88

Chemical and mechanical methods of Ribes eradication in the white-pine regions of Western United States. H. R. Offord, G. R. Van Atta, and H. E. Swanson.

Serial No. 89

Notes on some Ribes of California. C. R. Quick.

Serial No. 90

Variation in length of day. C. R. Quick.

Serial No. 91

Rate of penetration and absorption of Diesel oil in typical white-pine-type soils. H. R. Offord and R. P. d'Urbal.

Serial No. 92

Studies in the germination of Ribes seeds. Series of 1935-36. C. R. Quick.

Papers published during 1937 include:

Methods of propagating Ribes in nutrient solution for use as test plants. H. R. Offord, G. R. Van Atta, and C. R. Quick. U. S. Dept. Agric. Bur. Ent. & Pl. Quar. Mimeographed Series ET-106, June 1937.

The use of chemicals in brush burning. H. R. Offord and R. P. d'Urbal. Journ. For. vol. XXXV, No. 10, Oct. 1937. pp. 942-947.

RECOMMENDATIONS FOR THE USE OF CHEMICALS IN RIBES ERADICATION

Ribes roezli, R. viscosissimum, and *R. nevadense.* For the eradication of heavy concentrations of mature bushes, use the auxiliary oil method as described on pages 277 and 278 of the 1936 annual report. The single change from the methods previously advised is to mark each decapitated crown with a little oilers' waste. Chemically treated bushes are decapitated and oiled with Diesel oil 29° Bé at the dosage rate of 0.05 gallon of oil per average large plant.

For the treatment of occasional troublesome bushes of *R. roezli, R. viscosissimum* or *R. nevadense,* apply a 2-ounce dosage of dry ammonium thiocyanate or sodium thiocyanate to decapitated crowns. Either of these chemicals may be packaged in 2-ounce quantities and wrapped in half-pound kraft paper bags.

For the eradication of numerous *R. roezli* seedlings in reeradication work, spray the intact bushes with Diesel oil at the dosage rate of about 1 gallon of oil to 100 small plants. Three-year-old plants having 15 feet of live stem or more, or mature bushes (missed bushes) should be decapitated and oiled, or grubbed.

Ribes bracteosum. Dig or pull all small bushes or lateral root centers of large bushes. Decapitate the large central crown with a Pulaski or pruning shears, and soak the exposed crown tissue and the soil immediately contiguous to the crown with a saturated aqueous solution of ammonium thiocyanate. This treatment amounts to a dosage of about 1/4 pint of the aqueous solution per average crown. For details of suggested crew methods, see the memorandum to Mr. Davis dated July 6, 1937, prepared by H. R. Offord.

Ribes cereum. Decapitate large bushes or clumps at ground level or as close to rock crevice as possible. Then drench the crown and soil about the crown with Diesel oil 29° Bé or a mixture of Diesel oil (4 parts) plus crankcase oil (1 part) at the rate of 1/3 gallon of the mixture per average large clump. Where the crown can be thoroughly exposed, dosage can be limited to sufficient oil for coverage of the crown. Where the cut cannot be made close to the crown because of rooting habit in a rock crevice, surplus oil must be used. In past work the dosage has varied from 1/20 to 1 gallon, depending upon the size and location of the crown.

RIBES ECOLOGY STUDIES IN CALIFORNIA DURING 1937

The Growth Rate of Ribes roezli Plants on Eradicated Areas

The growth rate of Ribes roezli varies enormously in different habitats. Under conditions of severe competition, Quick has observed stunted plants of R. roezli which had grown less than one inch per year. Under unusually favorable conditions the increment of a rapidly growing seedling has been as much as 246 inches per year.

During 1937, Quick measured accurately the live stem on a number of R. roezli bushes selected for rapid and vigorous growth and for fruitfulness. In the present study, an effort has been made to determine the maximum growth rate and fruiting capacity of R. roezli.

Chowchilla Mountain. In the Sierra National Forest, just east of the crest of Chowchilla Mountain, there is an excellent sugar pine site. This area, prior to initial eradication, was densely populated with R. roezli, a species which regenerates from seeds, layers and sprouts from improperly eradicated crowns more rapidly in this region than in any other studied. The plants selected for this study were growing in the vicinity of Camp 2, an area which received initial eradication in the fall of 1935. The enormous number and size of bushes on this area contributed to imperfect crew work of the following types: (1) Small, but partly established plants overlooked in the jumble or removed live stem and debris on the badly disturbed ground, and (2) small layers left in the ground near the periphery of the circle representing the site of large eradicated bushes. For the removal of a large bush a considerable amount of chopping, digging, and prying are necessary. When the central crown of such a bush is loosened, it is usually yanked out of the ground with gusto and a feeling of accomplishment. In so doing, the live stem may be partly or completely pulled off the crowns of small layers which are then overlooked in the disturbed soil and beneath the piles of uprooted bushes. The following year these partly de-stemmed root centers sprout, and grow with great vigor. The removal of the large established plants, and the accompanying soil disturbance seem to make ideal growing conditions for any root

centers remaining in the soil. Portions of crowns have a great advantage over seedlings in that they have an established root system, which may be remarkably large because of the severe conditions under which it was established. Their fruitfulness, as measured by the number of fruits produced per foot of one-year-old stem (the fruit-bearing stem of R. roezli), is considerably in excess of that of seedlings of the same ages, at least for plants of two, three, and four years of age. Regrowth from partly eradicated layers is intermediate between the growth of "post-eradication seedlings" and that resulting from crowns of plants improperly eradicated. The year of origin of crowns and layers cannot be determined as definitely as it can for seedlings, and for this reason data shown in Table No. 13 for year of origin of crowns and layers are approximations.

The seedling problem in the Chowchilla Mountain area is also a troublesome one. The soil disturbance resulting from the initial eradication work in such an area sets up ideal conditions for the establishment of great numbers of vigorous Ribes seedlings. The greatest number of seedlings appear the first year after eradication, but many appear each spring for several ensuing years. In such areas the density of seedlings, and the resulting severe competition make for relatively slow growth in comparison with other post-eradication seedlings which, because of different conditions both before and after eradication, occur more or less singly. These more or less discreet seedlings show extremely rapid growth. Also of particularly rapid growth following eradication are those stunted seedlings which, although very small at the time of eradication, are one, two, or three years old. The severe competition existing prior to eradication, which dwarfed the plants, also forced the development of a disproportionately large root system, so that after eradication these plants are able to grow vigorously and to produce fruit a year or two sooner than post-eradication seedlings. In general, such dwarfed plants are slower in growth than "new" seedlings, but are considerably more fruitful.

Cow Creek. On the south and southeast sides of Cow Creek, in the NE 1/4 of Section 34, T. 5 N., R. 18 E., Stanislaus operation, is a very persistent concentration of R. roezli growing on an old logging camp site of the Pickering Lumber Company. This area was carelessly logged in 1926. The plots on which the present growth-rate measurements are made was part of an area used for experimental chemical work in 1931. The area received eradicative treatment in the fall of 1933, and again in the spring of 1936. The entire area is heavily grazed by cattle.

Since 1930 the Cow Creek area has become much more brushy, principally through a rapid increase in the number and size of Ceanothus cordulatus bushes. The growth rate of Ribes roezli seedlings is still very rapid, but probably not so rapid as it was after the initial eradication disturbance in 1931.

The bushes used in the growth-rate studies were selected for vigor and rapidity of growth from an area of perhaps twenty acres. The same general region includes Patty's 1.6 acre Cow Creek seedling-occurrence plot; the Cow Creek milacre seedling-occurrence plots; and plots A, B, C, and D, the small and intensively checked seedling-occurrence and seedling-growth-rate plots.

Table No. 12 records some of the data collected from seedling bushes on this area arranged for ready comparison with data from other areas.

Spanish Ranch. In June 1934, Quick observed eradication work on the top of the ridge back of Spanish Ranch, Meadow Valley, Plumas operation, a short distance west of the lumber tramway. The R. roezli plants were numerous, very fruitful, and of vigorous growth. The area of special interest was the site and the immediate surroundings of a large yarding donkey which had been in operation about 1927.

When revisited in the fall of 1937, the area showed the most rapid and most dense regeneration of R. roezli of any area observed on the Plumas operation. Growth-rate data on selected R. roezli bushes of rapid growth and unusual vigor were taken for comparison with similar data from other areas. Ribes from one milacre, selected for the amount and vigor of the gooseberries upon it, were eradicated and the live stem was recorded by bush and by year of growth. This work was done too late in the fall to collect data on the fruitfulness of the bushes.

Tables Nos. 12 and 14 present the collected data arranged for comparison with similar data from other study areas.

The data from the several areas record the astoundingly rapid growth of R. roezli seedlings and broken crowns following eradication. On the areas such as those studied, it might be expedient to space the reeradications at shorter intervals than is necessary on extensive areas of medium to light Ribes concentration. Unless this practice is adopted, it is highly probable that a crop of seed will be matured between any two eradications, thus indefinitely prolonging the eradication work. Any reeradication to be successful must either be performed the year before fruit is produced, or all work must be completed before seeds are matured during the year that fruit is first produced.

TABLE NO. 12

COMPARISON OF GROWTH RATES OF FAST-GROWING RIBES ROEZLI SEEDLINGS. DATA TAKEN FROM THREE DIFFERENT AREAS IN 1937.

Collection Area	Year of Origin	Number of Bushes	Average Amounts of Live Stem in Feet, on Bushes Studied by Years of Growth**						Average Size of Bushes Studied	Maximum Size of Bush Found	1937/1936 Live Stem Ratio in Per Cent
			1937	1936	1935	1934	1933	1932			
Chowchilla Mt.	1935	2	14.7	3.8	0.6	-	-	-	19.1	20.5	390
Chowchilla Mt.*		5	17.2	2.3	0.3	-	-	-	19.7	25.8	740
Cow Creek		18	14.0	1.8	0.2	-	-	-	16.0	35.8	790
Spanish Ranch		7	14.3	0.7	0.4	-	-	-	15.4	36.3	2,040
Average		8	15.1	2.2	0.4	-	-	-	17.6	29.6	990
Chowchilla Mt.	1934	4	10.7	5.1	0.7	0.2	-	-	16.7	25.3	210
Cow Creek		10	13.3	3.1	0.8	0.2	-	-	17.4	27.4	430
Spanish Ranch		10	22.4	2.2	0.6	0.2	-	-	25.4	67.9	1,020
Average		8	15.5	3.5	0.7	0.2	-	-	19.8	40.2	550
Chowchilla Mt.	1933	5	13.8	6.2	1.6	0.2	0.1	-	22.0	69.9	220
Cow Creek		3	53.3	9.0	0.8	0.2	0.3	-	63.7	106.0	590
Spanish Ranch		3	31.1	4.9	1.6	0.3	0.2	-	38.0	46.5	630
Average		4	32.7	6.7	1.3	0.2	0.2	-	41.2	74.1	480
Chowchilla Mt.	1932	5	7.8	8.6	1.8	1.1	0.3	0.1	19.7	57.3	90
Cow Creek		3	7.7	6.2	2.2	1.2	0.4	0.2	17.9	26.0	130
Spanish Ranch		6	43.8	12.8	4.2	1.3	0.5	0.2	62.7	95.0	340
Average		5	19.8	9.2	2.7	1.2	0.4	0.2	33.4	59.4	190

*Another group, selected along upper lateral road to camp 2.

**Bushes measured on dates as follows: Chowchilla Mt., July 30, 1937; Chowchilla Mt. near camp 2, Sept. 9, 1937; Cow Creek, Aug. 30, 1937; Spanish Ranch, Sept. 30, 1937.

TABLE NO. 13

COMPARISON OF GROWTH RATE OF SELECTED R. ROEZLI PLANTS,
DATA TAKEN IN 1937 ON CHOWCHILLA MT., CAMP 2 AREA, SIERRA OPERATION

Type of Plant	Year of Plant Origin	Number of Plants Studied	Average Total Size of Bushes Studied Feet of Live Stem	Maximum Size of Bushes Studied Feet of Live Stem	1937/1936 Live Stem Ratio in Per Cent	1936/1935 Live Stem Ratio in Per Cent	Average Number of Fruits Produced per Foot of 1936 Live Stem
Resprouting crowns	1935*	6	8.9	26.5	170	3,160	4.5
Incompletely eradicated layers	1935	11	71.8	24.6	210	1,370	7.2
	1934	14	12.1	50.2	240	930	2.3
	1933	4	17.2	23.0	240	820	3.3
	1932	1	23.8	23.8	240	1,020	2.8
	1931	1	10.2	10.2	190	870	5.2
Selected seedling bushes of exceptional vigor	1936	1	16.5	16.5	1,030	-	0.0
	1936**	11	20.3	34.2	1,010	-	0.0
	1936***	7	21.6	41.0	1,220	-	0.0
	1935***	5	19.7	25.8	740	870	0.0
	1935	2	19.1	20.5	390	600	0.0
	1934	4	16.7	25.3	210	750	0.6
	1933	5	22.0	69.9	220	380	1.5
	1932	5	19.7	57.3	90	480	5.7
	1931	1	24.0	24.0	200	170	3.3

* Resprouting crowns can be less accurately dated than seedlings; these plants all have 1937 and 1936 live stem on older crowns. Some of the roots are doubtless several years old.

** Another group of seedlings selected within the boundaries of camp 2. Measured September 9, 1937.

***Another group of seedlings selected along lateral road just west of camp 2. Measured September 9, 1937. The other seedlings, and the layers and crowns were measured July 30, 1937.

TABLE NO.14

SUMMARY OF PLANTS AND LIVE STEM REMOVED FROM SELECTED MILACRES, IN AREAS OF EXCEPTIONAL R. ROEZLI REGENERATION

Milacre Location	Year of Plant Origin	Number of Plants Found	Average Amounts of Live Stem on Bushes Studied, in Feet, by Years of Growth				Average Size of Bushes	Maximum Bush Size Observed	1937/1936 Live Stem Ratio in Per Cent	Total Feet Live Stem Found
			1937	1936	1935	1934				
Chowchilla Mt.	1937	30	0.1	-	-	-	0.1	0.3	-	3.0
Chowchilla Mt.	1936	229	0.8	0.2	-	-	1.0	7.3	360	229.1
Plot E	1935	5	3.2	1.2	0.3	-	4.7	7.3	260	23.5
Sub #C4*	1934	1	5.3	4.4	1.2	0.3	11.2	11.2	120	11.2
Spanish Ranch	1937	1	0.1	-	-	-	0.1	0.1	-	0.1
Spanish Ranch	1936	38	0.5	0.1	-	-	0.6	1.8	500	23.3
Milacre	1935	20	3.0	0.2	0.2	-	3.3	9.4	2,020	66.8
#1**	1934	5	28.0	2.9	0.7	0.2	31.7	60.5	980	158.4

* Eradicated late in fall of 1935, studied July 27, 1937.
** Eradicated early summer of 1934, studied September 30, 1937.

The Occurrence of Ribes Seedlings on Eradicated Areas

In 1936, a series of small ecological plots was initiated to study the occurrence of Ribes seedlings on eradicated areas. The plots are located in areas of exceptionally dense seedling regeneration, and are expected to yield valuable data on (1) the length of time that Ribes seedlings, particularly R. roezli, will continue to appear following the initial eradication of dense concentrations of Ribes, and (2) the maximum number of Ribes seedlings that may be expected to appear. Additional plots were established during the 1937 field season.

The following plots have been established for this study:

Cow Creek Milacres - Stanislaus. This group of 10 milacre plots is situated southwest of the Cow Creek eradication camp, in the NE 1/4, Section 34, T. 5 N., R. 18 E. (See description of the area previously given in discussion of growth rate, page 132 of this report.)

Six milacres were selected and checked in July 1936, prior to the 1936 hand eradication work in the area; and four additional milacres were added to the series in June 1937.

Table No. 15 is a summarization of the seedlings removed from this group of milacre plots during the two years that the study has been in progress.

Plot B - Stanislaus. This plot, having an area of 28 milacres, is located just east of the Cow Creek eradication camp (see (1) above), and is also a part of the old Cow Creek logging camp site.

Plot E - Sierra. This plot, 12 milacres in size, is on Chowchilla Mountain, just northwest of Camp 2. The plot lies in the SE 1/4, Section 34, T. 4 S., R. 20 E., on an old logging-camp site, and near an old logging railroad grade. The plot is in an area which, previous to the initial hand eradication in 1935, was practically covered with large and very fruitful R. roezli bushes. At the time of check, the regeneration of R. roezli seedlings was well advanced toward another "pure" stand of gooseberries.

Plot F - Sierra. This plot of 12 milacres is contiguous to and similar to plot E, but was studied later in the season.

Spanish Ranch Milacres - Plumas. This group consists of 6 milacre plots situated on the top of the ridge north and slightly west of the Meadow Valley Lumber Company's mill at Spanish Ranch. The plots are in Section 35, T. 25 N., R. 8 E. The area was carelessly logged about 1927. In 1934, when first inspected, the area contained a dense concentration of R. roezli mixed with sundry other brushy perennials. During logging operations of the Spanish Peak Lumber Company in 1927, the area was apparently the site of a large yarding donkey.

This series of small seedling-occurrence plots supplement the study of seedling regeneration of R. roezli subsequent to eradication, a study that was started in 1930 by Frank A. Patty on a 1.6-acre seedling-occurrence plot also established in the vicinity of Cow Creek. Several annual reports between the years 1930 and 1936 contain summaries of data collected from this 1.6-acre plot.

During 1937 the old 1.6-acre Cow Creek seedling-occurrence plot was surveyed as accurately as the available records would permit. Because of road construction and uncertainty about plot corners, the effective area of the plot as checked in 1936 and 1937 was reduced to 1.47 acres. During 1937 this plot was divided into seven sub-plots of unequal sizes with the object of segregating data on the basis of several distinct habitats represented on the larger plots. In the future it may be desirable to check only one or two of the sub-plots rather than the whole plot. If, however, the whole plot is checked, the data should be recorded by sub-plots because of the wide variation of ecological conditions among the several portions of the plot.

Table No. 16 is a summary of the data collected in 1937 from the 1.6-acre Cow Creek seedling-occurrence plot.

Several Ribes seedling-survival and seedling-growth-rate plots were initiated during 1937. Relatively few data on seedling survival and growth rate can be obtained from the study of a plot for a single year, but the plots are described here because their intial study yields valuable data on the occurrence of Ribes seedlings. These plots are as follows:

Plot A - Stanislaus. This plot, having an area of 30 milacres, is in the NE 1/4, Section 34, T. 5 N., R. 18 E., contiguous to the east boundary of the 1.6-acre Cow Creek seedling-occurrence plot, and just south of the Cow Creek road. It is crossed by an abandoned railroad spur, is close to an old log-loading station, and is within the destructively logged area on Cow Creek previously described.

Plot C - Stanislaus. This plot has an area of 21 milacres contiguous to the west boundary of the 1.6-acre Cow Creek seedling-occurrence plot, about midway between the north and south ends of the plot. Conditions are similar to those on plot A, described above.

Plot D - Stanislaus. This plot is 4-7/8 milacres in area, and is located close to the 1.6-acre Cow Creek seedling plot, and close to plot C, above. It is unique in that most of the plot was covered by two very large snow-brush plants, *Ceanothus cordulatus* Kell. One plant of *R. roezli*, growing near the center of the brush, was fruiting heavily. The brush was removed before data were taken and the number and location of the Ribes plants plotted on a map. In this plot the effect of grazing animals on the Ribes population subsequent to brush removal will be studied.

Butt Creek No. 1. This plot of 25 milacres is just southwest of the site of the (1935) Butt Creek eradication camp. The area surrounding the plot is very brushy, and has been both logged and badly burned. The plot, prior to hand eradication in 1935, supported many *R. roezli* bushes, and in 1937 still had a relatively large amount of ground free from vegetation. Although the plot lies on a gentle, northerly-facing slope above a small seepage, it was very dry when checked late in September 1937.

Butt Creek No. 2. This plot of 24 milacres is located a short distance north of the site of the (1935) Butt Creek eradication camp, in the same brush field as Butt Creek No. 1 plot. There are no living trees on or near this plot, which lies in open mixed brush in the bottom of a very shallow swale.

Spanish Ranch No. 1. This plot of 4 milacres is in the same area as that previously described for the Spanish Ranch milacre seedling-occurrence plots.

Table No. 17 is a summary of the seedling-occurrence data collected in 1937 from the seedling-occurrence plots, and from the seedling-growth-rate and seedling-survival plots. After one or more additional annual checks have been made, a more detailed presentation of data on the seedling-survival and seedling-growth-rate plots will be given.

TABLE NO. 15

RIBES ROEZLI SEEDLINGS REMOVED FROM COW CREEK MILACRE SEEDLING OCCURRENCE PLOTS DURING 1936 and 1937

Milacre No.	Number of R. roezli Seedlings Removed in June 1936. Calendar Years of Seedling Origin, and Age of Seedlings in Years, As Shown							Total Seedlings Removed in 1936	Seedlings Removed in June 1937. Years of Origin and Age of Seedlings, As Shown					Total Seedlings Removed in 1937	Total Seedlings Removed Both Years
	1936 CSS**	1935 1	1934 2	1933 3	1932 4	1931 5	1930 6		1937 CSS**	1936 1	1935 2	1934 3	1933 4		
I	548	87	21	-	-	-	-	656	301	-	-	-	-	301	957
II	2,666	95	6	-	-	-	-	2,767	1,012	-	-	-	-	1,012	3,779
III	1,490	155	3	-	-	-	-	1,648	509	-	-	-	-	509	2,157
IV	522	226	5	-	-	2	1	756	506	1	-	-	-	507	1,263
V	657	187	57	13	-	-	-	914	1,675	-	-	-	-	1,675	2,589
VI	244	263	9	1	-	-	-	517	365	2	4	-	-	371	888
VII*	-	-	-	-	-	-	-	-	127	21	17	6	1	172	172
VIII*	-	-	-	-	-	-	-	-	597	1	2	-	-	600	600
IX*	-	-	-	-	-	-	-	-	1,389	1	4	3	1	1,398	1,398
X*	-	-	-	-	-	-	-	-	606	46	20	1	-	673	673
	6,127	1,013	101	14	0	2	1	7,258	7,087	72	47	10	2	7,218	14,476

* Initiated in June 1937
** Current Season Seedlings

TABLE NO. 16

SUMMARY OF RIBES SEEDLINGS REMOVED IN 1937 FROM 1.6-ACRE COW CREEK SEEDLING-OCCURRENCE PLOT

Section of Plot	Area of Sub-plot in Acres	Approximate Number of Seedlings Per Acre, by Calendar Years of Plant Origin, and Ages of Plants in Years									Fruiting Bushes Per Acre	1936/1937 Seedling Ratio in Per Cent
		1937 CSS*	1936 1 yr.	1935 2 yrs.	1934 3 yrs.	1933 4 yrs.	1932 5 yrs.	1931 6 yrs.	1930 7 yrs.	Total Seedlings Per Acre Older Than CSS		
I	0.06	1,420	1,080	250	50	33	17	0	0	1,430	17	76
II	0.21	5,740	3,360	505	67	14	5	0	0	3,950	10	58
III	0.30	8,540	6,220	715	107	20	0	0	3**	7,065	0	73
IV	0.20	12,625	9,620	975	220	35	5	0	0	10,855	5	76
V	0.20	3,200	3,515	495	50	15	5	0	0	4,080	10	110
VI	0.20	575	465	65	35	35	5	0	0	605	5	81
VII	0.30	315	105	3	17	10	0	0	0	135	0	34
	Total*** 1.47	Aver. 4,913	Aver. 3,662	Aver. 437	Aver. 78	Aver. 21	Aver. 3	Aver. 0	Aver. 1	Average 4,203	Average 5	Average 73

* Estimated conservatively and left on the plot, the older seedlings removed.
** The only R. cereum found on the entire plot. Age 7 years, live stem about 7 inches.
***Bare part of much used road 0.04 acre, unworked portion of plot due to lost corner stakes 0.09 acre: total 1.60 acres.

TABLE NO. 17

SUMMARY OF SEEDLINGS OCCURRING IN 1937 ON CERTAIN RIBES ECOLOGY PLOTS

Plot Designation*	Operation	Type of Plot	Date of Check 1937	Area of Plot Acres or Milacres	Number of *R. roezli* Seedlings Found in 1937. Calendar Years of Seedling Origin, and Age of Seedlings in Years as Shown						Total Seedlings on Plots	Current Season Seedlings Per Milacre	1 year old Seedlings Per Milacre	$\frac{1936}{1937}$ Ratio in Per Cent
					1937 CSS	1936 1 yr.	1935 2 yrs.	1934 3 yrs.	1933 4 yrs.	1932 5 yrs.				
CCSO	Stanislaus	SO	6/20	1.6 a.	** 7,225	5,386	643	115	31	5	13,405	4.5	3.5	75
CCMA	do.	SO	6/11	10 ma.	7,087	72	47	10	2	0	7,218	709	-	-
"A"	do.	SGR	6/10	30 ma.	938	126	72	12	2	0	1,150	31	4.0	13
"B"	do.	SO	6/22	28 ma.	3,272	652	169	8	0	0	4,101	117	23	20
"C"	do.	SGR	6/23	21 ma.	2,598	200	33	5	3	0	2,839	124	9.5	8
"D"	do.	SGR	6/25	4-7/8 ma.	99	56	22	15	3	2	197	20	11	57
"E"	Sierra	SO	7/24	12 ma.	7,225	1,928	49	7	0	0	9,209	602	161	27
"F"	do.	SO	9/9	12 ma.	779	948	8	0	1	0	1,736	65	79	122
BC #1	Plumas	SGR	9/21	25 ma.	217	24	27	14	2	0	284	9	1.0	11
BC #2	do.	SGR	9/23	24 ma.	101	5	10	11	1	0	128	4	0.2	5
SR #1	do.	SGR	9/30	4 ma.	48	197	38	14	0	1	298	12	49	410
SRMA	do.	SO	9/28	6 ma.	347	648	68	17	1	1	1,082	58	108	187
Totals or averages ***				166-7/8	15,624	4,784	496	103	13	4	21,024	94	29	31

* CCSO = Cow Creek 1.6-acre seedling-occurrence plot; CC = Cow Creek; MA = milacre seedling plots; BC = Butt Creek; SR = Spanish Ranch.
SO = Seedling occurrence (seedlings eradicated); SGR = Seedling growth rate (seedlings counted and left on plot for development).

** Conservative estimate.

*** The first two plots, because of previous experimental workings are not included in this horizontal column of totals and averages.

Ribes Regeneration Plots

During 1937, two one-acre plots were established on which it is proposed to follow the regeneration of Ribes subsequent to the various steps in the establishment of control for the areas represented by these plots. These plots are the first of a series which will be extended as rapidly as time and assistance will permit. These regeneration studies are ecologic in nature, and in no sense are they intended to furnish a check on the method of the checking organization.

Prior to eradicative work on the area by the field crews, the 1937 plots were mapped and examined. Accurate data on the number, location, size, and vigor of bushes were recorded. After initial Ribes eradication had been performed on the area containing the plots and the area had received a regular check, the plots were examined a second time and data pertaining to the Ribes bushes left were recorded. Additional examinations of these plots will be made from time to time to study the regeneration of individual Ribes bushes and of the Ribes population as a whole. The selection of plot sites is determined by variation of eradication type, kind and density of Ribes, and type and density of associated perennials, especially brush. It is hoped that ultimately two or more of these plots can be established on each of the several eradication operations.

Two plots, both located on the Sierra operation, were all that were established in 1937. These were selected on the basis of ecological factors, and were located completely at random with respect to eradication and checking areas. Brief descriptions of these two plots, and short summaries of the data collected from them, follow:

Pilot Peak Plot. This plot, 8 chains long and 1.25 chains wide, is in the SW 1/4, Section 5, T. 6 S., R. 21 E., just south of Pilot Peak, at an altitude of about 4,800 feet, near the lower limit of sugar pine type. The plot shows considerable variation in ground cover, but in general it is part of an open, logged, and burned forest of yellow pine, white fir, incense cedar, and sugar pine, with abundant bear clover, *Chamaebatia foliolosa* Benth., on the forest floor. Incense cedar and yellow pine reproduction predominate on portions of the plot. The Ribes population varied from very dense in some of the sub-plots, to practically no Ribes in others. Many of the small *R. roezli* bushes were intimately associated with bear clover, a condition which made the area a difficult one for the eradication crews to work effectively.

The Pilot Peak one-acre plot was located and first examined on July 19, 1937. The size of each bush was recorded to the nearest whole foot. Thus, all seedlings, no matter how small, were given as having at least one foot of live stem. A single plant of *R. nevadense* was found; the rest of the Ribes were *R. roezli*. Of the 1,032 plants originally recorded on the plot, 235 (22.8%) had live stem of one foot or less, 425 plants (41.2%) had from 2 to 5 feet of live stem, 241 (23.3%) from 6 to 15 feet, 102 (9.9%) from 16 to 40 feet, 24 (2.3%) from 41 to 100 feet, and 5 (0.5%) from 101 to 200 feet. No bush larger than 200 feet of live stem was found. The average size of all the bushes recorded was 8.8 feet, and the total amount of live stem was 9,107 feet. Of the total of 1,032 bushes, 135 bushes (13.1%) were fruiting. A rough vegetative type

map of the plot was prepared. The data were recorded by sub-plots of 1/16 acre (in order that they might be better related to the variety of conditions present.)

On September 4, 1937, after initial Ribes eradication had been performed on the quarter section which was then checked and passed as meeting the current standards of eradication efficiency, the plot was carefully re-examined. Because of the small size of the remaining bushes, bush size was recorded in inches of live stem. Of the forty-two Ribes plants found on the acre, 11 (26.2%) had from 0 to 4 inches of live stem, 21 (50.0%) had from 5 to 12 inches of live stem, 7 (16.7%) from 13 to 36 inches, 1 (2.4%) from 37 to 72 inches, 1 (2.4%) from 73 to 143 inches, and 1 (2.4%) from 12 to 24 feet of live stem. No bush of 25 feet or more of live stem was found. There were four bushes (9.8%) with live stem of 3 feet or more. None of the bushes remaining on the plot were fruiting. The total live stem left on the acre was 54.25 feet. The average size of the bushes was therefore 1.3 feet.

Signal Peak Plot. This plot, 7 chains long and 1-3/7 chains wide, is in the NW 1/4 of Section 7, T. 5 S., R. 20 E., just below the Forest Service road to Signal Peak lookout on Chowchilla Mountain. The plot is at an altitude of about 6,500 feet, and is within the important altitudinal range of the sugar pine. The southerly exposure of the plot, however, tends to minimize the effects of altitude, and the plot has a great deal of bear clover upon it. The associated trees, in approximate order of abundance, are white fir, sugar pine, incense cedar, yellow pine, and black oak. The area, however, has been logged, and probably burned also, and sundry brush species, particularly snow brush, Ceanothus cordulatus Kell., and Greene's manzanita, Arctostaphylos patula Greene, are more prominent on the plot than mature trees or reproduction. An old road crosses the plot, and a small logging camp was probably once situated on or close to the southeast end. The area is lightly grazed. The plot was divided into fourteen sub-plots, which vary greatly in type and amount of ground cover, density of Ribes, and amount of coniferous reproduction. Several of the sub-plots presented a very difficult eradication problem because of the occurrence of numerous small R. roezli plants in close association with the bear clover.

This plot was first examined on July 29, 1937. On the plot, 682 bushes of R. roezli, with a total live stem of 13,071 feet, were found. The average size of plant was therefore about 19.2 feet of live stem. Data for the classification of plants according to size are as follows: 107 plants (15.7%) 0 to 1 foot, 133 (19.5%) 2 to 5 feet, 179 (26.3%) 6 to 15 feet, 185 (27.1%) 16 to 40 feet, 71 (10.4%) 41 to 100 feet, and 7 (1.0%) 101 to 200 feet. No bush larger than 200 feet was found. Of the 682 plants found, 307 (45%) were fruiting. The Ribes density on a per acre basis for the 1/14-acre sub-plots varied from 112 to 1,932 bushes, and from 1,120 to 34,890 feet of live stem.

On October 17, 1937, after the area containing the plot had been worked by the usual hand-eradication methods, and had then been checked and passed on the basis of present control standards, the plot was very carefully re-examined. One hundred and two R. roezli plants, with a total live stem of 219.25 feet, were found. For the acre plot the

average size of the missed plants was therefore 2.2 feet. The segregation of the plants according to size follows: 38 plants (37.2%) from 0 to 4 inches of live stem, 26 (25.5%) 5 to 12 inches, 19 (18.6%) 13 to 36 inches, 13 (12.7%) 37 to 72 inches, 2 (2.0%) 73 to 143 inches, and 4 (4.0%) 12 to 24 feet. No bush in excess of 25 feet of live stem was found. Of the 102 plants found, 46 (45.1%) had 1 foot or more, and 24 (23.5%) had 3 feet or more of live stem. The lateness of the check prevented telling which, if any, of the Ribes remaining on the plot had produced fruit in 1937.

No extended discussion of the Ribes population on these two Ribes regeneration plots will be offered at this time. The purpose of the plots is to study the establishment and growth of Ribes subsequent to eradication, and until data of additional years are available no conclusions can be drawn.